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ABSTRACT

A study involving 211 students enrolled in eight sections of a general psychology course at Brevard Community College was conducted to determine if the course activities and testing methods were biased toward certain personality types, as defined by the Myers-Briggs Type Inventory (MBTI); and to evaluate the usefulness of the MBTI as a learning activity. During the study, students were administered the MBTI and later asked to indicate the accuracy of the results and their attitudes toward the MBTI. After the students had completed the course, a correlation analysis was performed to identify the significant differences that existed in satisfaction with the course among students in nine of the 16 MBTI personality types. Course satisfaction was measured in terms of grade point average and student ratings of the course and instructor. The study report describes methodology and findings as they relate to: (1) the frequencies of the 16 MBTI types in the sample; (2) the differences between these frequencies and the normative pattern for college freshmen described by the Center for Applications of Psychological Types; (3) the differences in student achievement and course satisfaction among the personality types; (4) the differences in grades earned by students in the nine personality groups studied and the grades of students categorized as other types; and (5) student attitudes toward the MBTI and variations in these attitudes among student types. (JP)

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General Psychology Achievement and Course Satisfaction Compared with the Myers-Briggs Type Indicator

GLORIA D. WHITNEY

A MAJOR APPLIED RESEARCH PROJECT
PRESENTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF DOCTOR OF EDUCATION

NOVA UNIVERSITY

1980

JC 810 098

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Abstract of a Major Applied Research Project Presented to Nova University in Partial Fulfillment of the Requirements for the Degree of Doctor of Education.

GENERAL PSYCHOLOGY ACHIEVEMENT AND COURSE SATISFACTION COMPARED WITH THE MYERS-BRIGGS TYPE INDICATOR

by

Gloria D. Whitney

September, 1980

Since 1968, the general psychology course taught by James and Gloria Whitney, at Brevard Community College, has been researched and revised to maximize student achievement and satisfaction. Data was presented to demonstrate the consistently high levels of achievement and satisfaction evidenced since 1976. However, since personality type differences had not been examined for a relationship to levels of course grades and course satisfaction, a systematic bias toward certain personality types could have been occurring. Therefore, the primary purpose of this study was to determine if there were any significant differences between "General Psychology I" students' course grade points, ratings of the course, and ratings of the instructor among different personality types. The personality inventory used was the Myers-Briggs Type Indicator and the secondary purpose of this study was to evaluate the acceptability of the MBTI as a learning activity.

The Indicator was administered to the students in

eight "General Psychology I" sections taught by the Whitneys. Later in the term, each student was presented with his/her MBTI profile, asked to rate the accuracy of the inventory results, and then indicate if the MBTI should continue to be used with the course. At the end of the term, after students knew their psychology course grades, they rated the course and the instructor.

The distribution of MBTI personality types of the 211 BCC students was compared (chi-square) with the distribution of college freshmen (N = 11,122) described by the Center for Applications of Psychological Type, Inc. Although the ENFP type was most prevalent in both distributions, the BCC distribution pattern differed from the CAPT pattern at greater than the 0.001 probability level. Therefore, it was recommended that further BCC studies be conducted to determine the MBTI distribution of types in the general population at Brevard Community College. It was also recommended that community college norms be established, and identified, separately from the university data.

Nine of the 16 MBTI categories contained 10 or more students and they were included in a discriminant function analysis which checked for differences (grade points, ratings of the course, ratings of the instructor) among the MBTI types. No combination of the three dependent variables was significant at the 0.05 level. The only significant relationship found by the analysis was the correlation

between course ratings and instructor ratings (r = .55). Testing (t-tests) also revealed no significant differences in grade points, ratings of the course or ratings of the instructor between the group of MBTI types included in the discriminant analysis compared with the group of MBTI types not included in the analysis. Accordingly, it was recommended that the "General Psychology I" instructional system be continued, since it appears not to be biased toward particular personality types. However, for comparative purposes, it was recommended that further testing be conducted with an additional personality instrument, such as The Transactive Style Inventory. An additional recommendation was made to accumulate longitudinal data to determine if some personality types are associated with early course termination.

Most students (81%) rated all four of their MBTI preferences as accurate personality descriptions, and there was no significant difference in perceived accuracy of the MBTI between students who received higher course grades (A and B) compared with students who received lower course grades (C and D). Nearly all students (99%) said that the Indicator should continue to be used with the psychology course. Therefore, it was recommended that the Myers-Briggs Type Indicator be retained in the "General Psychology I" course as an activity class designed to demonstrate personality testing procedures.

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Chapter 1

INTRODUCTION

Background and Rationale

Brevard Community College, in keeping with its long-term goal of excellence in education, has regularly provided educational growth experiences through its staff and program development projects. For example, in 1968, when there was an emphasis on innovation via instructional systems, Brevard Community College, as part of an in-service program, offered the course "Systems Approach to Instruction."

After participating in that course, James and Gloria Whitney examined the possibilities of that method to facilitate student learning and became convinced that an instructional system would facilitate student learning in their psychology classes. Accordingly, through a cooperative effort they developed, implemented and evaluated a nontraditional "General Psychology" course. Their system included a study guide (encompassing behaviorally stated instructional objectives, self-tests and answers to self-tests), multi-media presentations, criterion-referenced testing, and pre-set grading scales (Whitney & Whitney, 1971).

During the first several revisions, cognitive learning was emphasized; formative and summative evaluations

(as described by Bloom, Hastings & Madaus, 1971) provided the basis for course revisions. Subsequent revisions, influenced by the humanistic trend toward affective education, broadened the scope of the course through the addition of student involvement and self-awareness sessions. Longitudional evaluations were then conducted to check for stability in student achievement and satisfaction. An analysis (Whitney, G., 1978) of this instructor's "General Psychology" courses over a four semester period (January 1976, August 1976, January 1977, August 1977) yielded no significant differences in passing grades (see Appendix A), ratings of the course (see Appendix B) or ratings of the instructor (see Appendix C).

During 1978 another course revision was made in order to incorporate student-participation activities into the course and grading scale. The "activity classes" included psychomotor activities (such as steadiness, grip strength, reaction time, and rotor tracking tasks) as well as self-evaluations (psychological tests, stress rating scales and life expectancy scales, for example) and class surveys (opinions on marriage styles). In order to determine if the new revision changed the previously stable achievement and course satisfaction pattern, the performance and course satisfaction ratings of the fall term of 1977 were compared with the winter term of 1978. There were no significant differences in grades, course ratings or instructor ratings (see Appendixes D, E and F).

Following the advice of Doyle (1975) who recommends that course ratings should be anonymous, prior to the winter term of 1979, all student evaluations of this psychology course and instructor were completed anonymously. However, since grade feedback is provided throughout the course and grades are criterion-referenced, it was postulated that the use of an evaluation form which included the student's name would not cause a significant change in the pattern of the ratings. Accordingly, at the end of the winter term of 1979, names were requested on the end-of-course evaluations. In all other respects, the form was the same as the rating scale previously used. When the same term (winter) 1978 students' ratings (anonymous form) were compared with the 1979 students' ratings (name on form), no significant differences were found in the course or instructor ratings (see Appendixes G and H). The results should not have been influenced by performance since end-of-term grades also were not significantly different between the 1978 and 1979 groups (see Appendix I).

Although course performance was judged to be acceptable (modal grade = B), this instructor questioned the possibility that objectives, activities and testing methods designed for the psychology course (currently designated PSY 2013--"General Psychology I") were biased toward certain personality types. Accordingly, plans were made to administer the Myers-Briggs Type Indicator (MBTI) to a sample of psychology students enrolled in the winter term of

1979, to ascertain if there were any significant differences between levels of student achievement and course satisfaction among different personality types. The Myers-Briggs Type Indicator, a personality inventory constructed to implement Jung's theory of type (1923), was selected because of the wide range of personality types (16) measured and because it was specifically designed for use with normal subjects (MBTI Manual, 1962).

In January of 1979, as a result of an expressed interest by the faculty concerning the relationship between personality and learning styles, Everett Whitehead (BCC counselor) held a "Cognitive Style Mapping Seminar Utilizing the Myers-Briggs Type Indicator." The seminar provided information on the potential counseling use of the MBTI and afforded a test-retest reliability check of the writer's personal MBTI scores.

Then, in July of 1979, this investigator had the opportunity to attend a Myers-Briggs Type Indicator workshop conducted by Mary McCaulley, a clinical psychologist who, for over ten years, has been working with Isabel Briggs Myers, the author of the MBTI. The workshop was presented by the Center for Applications of Psychological Type, Inc. (CAPT) located in Gainesville, Florida. The training program provided practical experiences in the use and interpretations of the MBTI and disseminated information about current MBTI research.

Statement of the Problem

Purpose of the Investigation

Although there had been stability in student achievement and ratings of the psychology course, personality type differences had not been examined for a relationship to levels of course grades and course satisfaction. Since a systematic bias toward certain personality types could have been obscured by the methods previously used to evaluate the course, the primary purpose of this study was to determine if there were any significant differences between "General Psychology I" students' course grade points, ratings of the course and ratings of the instructor among different personality types as described by the Myers-Briggs Type Indicator. The secondary purpose was to evaluate the acceptability of the Myers-Briggs Type Indicator as a learning activity.

Research Questions and Hypotheses

A series of research questions were formulated to provide both objective and subjective measures of the use of the Myers-Briggs Type Indicator in the "General Psychology I" course. The questions were related to distribution of MBTI types, comparison of MBTI types with achievement and ratings, and perception of the MBTI.

MBTI personality types. Frequency distribution patterns of the Myers-Briggs Type Indicator were examined.

Research question 1. What frequencies of the 16 MBTI types appeared in the BCC sample group?

Research question 2. Were BCC frequencies of MBTI types different from the normative pattern for college freshmen?

Hypothesis 2. There is no significant difference between the observed Brevard Community College frequencies of the Myers-Briggs Type Indicator types and the expected frequencies for a sample of 211 college freshmen.

Types compared with achievement and satisfaction. Student performance (PSY 2013 course grade points) and course satisfaction (ratings of the course and instructor) were compared with MBTI types.

Research question 3. Were there significant differences in student achievement and course satisfaction among different personality types?

Hypothesis 3. There are no significant differences between "General Psychology I" students' course grade points, ratings of the course, and ratings of the instructor among different personality types as described by the Myers-Briggs Type

Indicator.

Research question 4. Were the MBTI types included in the discriminant function analysis atypical from the MBTI types not included in the analysis?

Hypothesis 4a. There is no significant difference between the mean "General Psychology I" course grade points earned by the Myers-Briggs Type Indicator types included in the discriminant function analysis and the mean course grade points earned by the MBTI types not included in the analysis.

Hypothesis 4b. There is no significant difference between the mean rating of the "General Psychology I" course made by the Myers-Briggs Type Indicator types included in the discriminant function analysis and the mean rating of the course made by MBTI types not included in the analysis.

Hypothesis 4c. There is no significant difference in the mean rating of the "General Psychology I" instructor made by the Myers-Briggs Type Indicator types

included in the discriminant function analysis and the mean rating of the instructor made by MBTI types not included in the analysis.

Perceptions of the MBTI. In order to ascertain the worth of the Myers-Briggs Type Indicator as a personality testing and feedback class activity, psychology students were asked about their perceptions of the accuracy and acceptability of the instrument.

Research question 5. How did students feel about the accuracy of the MBTI descriptive profiles?

Research question 6. Did perceived accuracy of the MBTI descriptive profiles vary according to type?

Research question 7. Did students who demonstrated different achievement levels have differing perceptions of the accuracy of the MBTI?

Hypothesis 7. There is no significant difference in perceived accuracy of the Myers-Briggs Type Indicator between students who receive higher "General Psychology I" course grades (A and B) compared with students who receive lower course grades (C and D).

Research question 8. How did students feel about the acceptability of the MBTI as a class activity?

Procedures

A quasi-experimental research design (see Barton & Mines, 1973) was utilized to investigate student achievement and course satisfaction compared with Myers-Briggs Type Indicator personality types. Descriptive data was collected regarding students' perceptions of the Indicator.

Form F of the Myers-Briggs Type Indicator was administered to all students who attended the designated activity class. Other data sources were class activity forms, course and instructor rating forms, and PSY 2013 course grade points.

A discriminant function analysis was employed to analyze and interpret the major question regarding student achievement and course satisfaction compared with the MBTI personality types. Chi-square and t - tests were used to evaluate the remaining questions.

Assumptions

For the purposes of this study, it was assumed that the sample of students involved was representative of the population of students who enroll in the Brevard Community College "General Psychology I" courses taught by James and Gloria Whitney. It was presumed that there was reasonable homogeneity in their ability to learn (intelligence) and in

their motivation to achieve.

It was also assumed that the sample consisted of normal subjects who reflected their true feelings when marking the self-report instruments.

Delimitations

There is no "General Psychology I" course coordinator at Brevard Community College; consequently, the PSY 2013 courses run the gamut from loosely-structured discussion classes to highly-structured classes involving the use of behaviorally stated learning objectives and criterion-referenced testing. In order to reduce the instructional variables to one methodology, all PSY 2013 classes were excluded from this study except the eight sections taught by James and Gloria Whitney (who have been collaborating on the development of the described instructional method since 1968).

Performance pretesting was not employed since it was not the usual procedure followed in the PSY 2013 course. A previous study (Whitney, J., 1978) found no significant differences in course performance (grades) between students who had experienced pretesting and those who had not; accordingly, there were no efforts to change the instructional sequence to include pretesting.

Limitations

An ideal investigation of student achievement and course satisfaction compared with Myers-Briggs Type

Indicator personality types would encompass all sixteen MBTI types. However, only nine personality type categories were analyzed by the discriminant function analysis since, according to Barton (1979), seven of the categories had frequencies too low (less than 10) to yield reliable inferences.

The results of the study should be representative of the population of students involved and, perhaps, inferences may be drawn for future students assigned to the same instructors utilizing the same instructional techniques in day classes at Brevard Community College. However, it is unlikely that the results may be generalized to other instructors' students, especially if the students are exposed to instructional techniques decidedly different from those described in this study.

Definition of Terms

For the purpose of this study, the following terms and abbreviations were defined as indicated:

BCC - Brevard Community College

CAPT - Center for Applications of Psychological Type, Inc.

PSY 2013 - Florida's statewide course number for "General Psychology I"

Behaviorally stated learning objectives - educational objectives specifically describing what behaviors students are expected to perform after instruction

Behavior categories (of objectives and activities):

Cognitive - acquisition of, and ability to apply, knowledge

Affective - expression of opinions and values

Psychomotor - participation in psychophysiological experiences

Criterion-referenced testing - testing keyed to objectives presented

Criterion-referenced grading - grading based on a pre-set standard of achievement; a course criterion established by the instructor

Passing grades - A through D

Statistical significance - a statistical probability of .05 or greater

MBTI - Myers-Briggs Type Indicator

Indicator - Myers-Briggs Type Indicator

Preferences (on the MBTI):

Extraversion - focus oriented primarily to the outer world, tendency to focus perception and judgment upon people and things

Introversion - focus oriented primarily to the inner world, tendency to focus perception and judgment upon concepts and ideas

Sensing - awareness of things directly through one or more of the senses

Intuition - awareness through indirect perception by way of the unconscious

Thinking - reliance upon thinking to discriminate impersonally between true and false

Feeling - reliance upon feeling to discriminate between valued and not-valued

Judging - reliance upon a judging process in dealing with the outer world

Perception - reliance upon a perceptive process in dealing with the outer world

(Preferences condensed from MBTI Manual, 1962)

Significance of the Study

As part of the general education requirement (see BCC Catalog, 1979-1981), Brevard Community College students must complete one 3-credit-hour course in the Behavioral Sciences. For this requirement students may elect "General Psychology I," "Human Adjustment," or "Introduction to Sociology." For many students, the choice is determined by the prerequisite requirements of their major-field courses; however, a recent report (BCC Opportunities, 1980) indicated that of the 53% of BCC students who identified an AA degree as their goal, 47% did not list a specific major. For this latter group, the choice of a Behavioral Sciences' course would be facilitated if they were counseled regarding their probable chances of success and satisfaction in each of the three available courses.

The first step toward course selection counseling involves significance testing of factors presumed related to academic success in the Behavioral Sciences. A 1977 study (Whitney, J.) found that the Davis Reading Test (Form 1A) and the Survey of Study Habits and Attitudes (Form C) did not significantly correlate with PSY 211 (old number for current PSY 2013) course grades. Since these traditional predictors of academic performance did not discriminate levels of achievement in the Whitneys' instructional system, it was theorized that personality factors might be the major contributors toward any differences in student achievement and course satisfaction in a criterion-referenced course ("General Psychology I"). Consequently, a personality inventory, the Myers-Briggs Type Indicator, was chosen to test this hypothesis. The MBTI was selected because it generates sixteen different personality types, is well-researched (as shown by the 1979 CAPT MBTI Bibliography) and, according to Sundberg (1965), the item content is not usually seen as threatening. Therefore, the Indicator had potential value both as a course achievement and satisfaction predictor and as a class activity for the topic of personality testing.

If significant differences were found in PSY 2013 achievement and course satisfaction among the different MBTI personality types, future course revisions would center on devising more effective teaching strategies for any low-achieving or low-satisfaction types. The intent of the

revisions would be to offer the opportunity for all "personality types" to attain equally high performance and satisfaction levels in "General Psychology I."

Student satisfaction may well be the means to increase enrollment at Brevard Community College. Comptroller Megregian (1979) has stated that only about 40% of Brevard County's high school graduates who go on to college enroll at BCC. Universities and community colleges are currently competing for the undergraduate liberal arts student (BCC Faculty Senate Minutes, 1979); therefore, word-of-mouth recruitment could help influence students' decisions to attend this institution. If more students become convinced, through effective and enjoyable educational experiences, that BCC's instructional concern is twofold: course achievement and course satisfaction, then more persons can be expected to opt for educational opportunities at Brevard Community College.

The next chapter presents a review of related literature on MBTI types, performance and evaluation.

Chapter 2

REVIEW OF RELATED LITERATURE

Although there is a multitude of literature pertaining to personality, this literature review will primarily focus on a personality inventory, the Myers-Briggs Type Indicator. The literature discussion will be organized into three sections which will deal with MBTI personality, the MBTI compared with performance, and factors associated with evaluation.

MBTI Personality

The Myers-Briggs Type Indicator appears to be a versatile instrument. A scan of the MBTI Bibliography (1979) reveals topics ranging from pharmaceutical salesmen (Connelly, 1967) to parapsychology (Murphy & Lester, 1976). However, the bulk of the references relate to the medical, educational and counseling areas.

Medical Areas

Some of the earliest research was accomplished with medical and allied health students. In 1965 Myers and Davis reported a longitudinal study which related medical students' MBTI types to their specialties twelve years later and, in 1977, McCaulley wrote a monograph which elaborated on that longitudinal study. Historical perspective is also gained

through reading Cuca, Sakakeeny and Johnson's review (1976) on the changes in MBTI personality characteristics of accepted and rejected applicants for medical school through admission process changes during 1955-1967. In 1974 a conference on cognitive and affective dimensions of the allied health student was held; of the ten papers presented (then edited by Morgan), two titles referred to the MBTI.

In 1971 Durfee found no significant differences in the MBTI Judging and Perceiving scores of students in medicine, psychology and social work; however, he did find medical students significantly more Intuitive and Perceiving. He also found that the majority of the psychology students were classified as ENTP and held a less negative attitude toward disabled persons than did the other two groups.

Quenk and Heffron (1975) analyzed MBTI types of 91 family practice teachers and 85 residents. They reported that the family practice group differed from the general medical population by having a larger percentage of persons who tended to be practical, realistic, present-oriented, organized and able to deal effectively with factual information. The residents and faculty differed in that more of the faculty tended to make judgments by considering human values and understanding people. Mitchell (1976) recommended that the MBTI be used as part of a longitudinal tracking system designed to distinguish the characteristics of those physicians who enter primary care practice in underserved areas.

The MBTI was also used by Rezler and Buckley (1977) to investigate the personality traits of female students in medicine, pharmacy, medical technology, physical therapy, dietetics, and occupational therapy. Their results showed that medical students were guided more by thinking than feelings; pharmacy students preferred well-planned, routine work whereas occupational therapy students preferred changing situations and flexibility.

When Ritchie (1975) compared student nurses with successful registered nurses, she learned that student nurses distributed in 13 of the 16 MBTI categories and the majority of the students showed ESFJ preferences whereas the group of registered nurses distributed in only nine personality categories; their modal preferences were ISTJ and ENFP. Ritchie also found that learning by lecture was most preferred by students while learning by reading was most preferred by registered nurses. Both groups least liked to learn solely by audio recordings; consequently, she recommended that educational programs should be structured to accommodate different styles. The personality styles, however, could be temporary--during training. Bruhn, Floyd and Bunce III (1978) tested nurse practitioners at the end of their program and again one year after graduation; they noted that students tended to be more introverted, perceptive and externally controlled at the end of the program than at the beginning. Nevertheless, one year after graduation, the nurse practitioners' psychological profiles tended to

resemble those obtained on entry to the program

Hirschfeld, Matthews, Mosher and Menn (1977) reported differences in MBTI personality characteristics of Soteria House's nonprofessional staff compared with staff from two other treatment programs for schizophrenics. The staff of the unstructured treatment environment at Soteria House preferred significantly more Intuition and Introversion than did the traditional staff.

Educational Areas

Many investigators have used the MBTI to conduct educational research. Two articles by Richek (1969) describe the assessment of 365 prospective teachers. He found that the elementary school teachers-to-be had higher Extraversion scores and the secondary teachers-to-be had higher Perceiving scores. When the Bown Self-Report Inventory (SRI) was completed, the Extraverts scored higher on measures of psychological adjustment and showed more positive perceptions of children than did the Introverts. A different study (Bown and Richek, 1969) assessed 149 female elementary and secondary school student-teachers on measures of Extraversion/Introversion and self-perception. Extraversion (N = 100) was again related to positive perceptions of children and self. Accordingly, Bown and Richek have suggested that Introverted teachers may be more suitable for teaching above the fifth grade level. Another study with teacher candidates was conducted by Asbury, Ball and

Constantino (1970). They found that scores on the Extraversion-Introversion and Sensation-Intuition scales did not differ significantly before and after a foundations of education course; however, there were significant mean movements from Judgment toward Perception and from Thinking toward Feeling.

Teaching styles have also been investigated. Smith (1970) checked for a relationship between MBTI types of teachers, subjects taught, and preferences for behavioral objectives. He found no relationship; however, in 1973 Smith stated that research at the University of Florida indicated that there was a correlation between students' scores on the MBTI and preferences for college teaching methods, such as individualization of instruction. According to Rudisill (1973), self-paced math courses were preferred teaching strategies of MBTI Extraverted teachers. Sensors gave higher ratings to the math lab approach and Perceptives felt that questioning was personally useful. In 1974 Smith and Irey reported their findings on a self-paced course in thermodynamics. Extraverts felt that the course's progress quizzes were effective, spent more total time on quizzes and used course reference supplements more often. Introverts attended more lecture sessions. There was a tendency for civil engineering and industrial systems engineering students to be Sensors, and Sensors felt that students who took more than a quarter to complete the course should fail

or get a low grade. Intuitives had taken more self-paced courses. A preference for Judging was associated with a higher grade point average, larger course load, not the first registration in the course, and a feeling that grades are meaningless when half of the group gets A's; they also expressed an opinion that self-paced courses are dehumanizing. The Perceptives felt that the monitors in the self-paced course were helpful. As a result of these findings, Smith and Irey advised making self-paced courses more effective by designing modules or packages which fit different styles of perception and judgment.

Designing instructional packages for different styles assumes special importance for community college instructors since their MBTI types are mismatched with students, according to Roberts (1975). In a study of 354 instructors and 335 students, he reported that the community college students scored high on Sensing and Judging--preferences also prevalent in classroom teachers of grades K-12 (Lorentz & Coker, 1977)--whereas the instructors scored high on Intuition and Perception. Oberlin (1978) recommends that the Judging-Perceptive continuum along with signed distance (the difference between leaders' and students' scores on the four MBTI continua) be used to place students with seminar leaders and she feels that it would be helpful in hiring the seminar leaders.

The modal MBTI profiles of scientists also indicate Intuition (McCaulley, 1976). Scientists tend to be

Introverts and McCaulley states that there are more Thinking preferences associated with the physical sciences but more Feeling preferences associated with the behavioral sciences. Rowe (1978) concurred that persons who prefer T tend to be working in the natural and physical sciences whereas persons who prefer F tend to be in the social sciences. Rowe also explains that scientists who have differing MBTI preferences find satisfaction in different types of activities; for example, Intuitives prefer theory over lab work, Sensors like observation and classification, Extraverts enjoy teaching and Introverts prefer to work on their own.

Counseling Areas

In 1967 Goldschmid stated that it was possible, through the use of personality tests such as the MBTI, to predict college majors. Westcott (1968) felt that intuition and introversion, specifically, might be related to problem-solving abilities. Nevertheless, when he traced the history and evolution of intuition, he found that neither the Sensation-Intuition nor Extraversion-Introversion scales showed a relationship to problem-solving. Intuition and Perception scores, however, were found to be higher in counselors than in their clients (Fretz, 1966) although personality correlates of postural movements were unrelated to type.

Other physiological factors were investigated by Clark (1970). She assumed that empathic persons would have

a closer physiological relationship than nonempathic persons but measures of skin conductance, pulse rate and respiration rate did not distinguish between the groups. Another study did show MBTI group differences in physiology: Corlis, Splaver and Wisecup (1967) found that Intuitives were taste sensitive on the Harris-Kalmus Taste Threshold Test whereas Sensors were taste insensitive.

Perceptions were also investigated. Time perspective was explored by Seiden (1970) who noted that Sensors had a narrower orientation to present experience than Intuitives but Intuitives were no more future oriented than Sensors. Thinking was related to a greater timelessness than Feeling which implied a pastness. When Veach and Touhey (1971) gave a time perception accuracy task to 41 undergraduates at the University of Nevada they found that accurate time perceivers scored significantly higher on Extraversion and Perception than did inaccurate time perceivers.

Insel, Reese and Alexander (1968) gained knowledge of students' interpersonal and intrapersonal perceptions of self by using the "Who Am I?" technique. The students who used group-relevant or externally identifiable referents were found to be oriented toward Sensing and Judging. The Sensing-Judging types, however, were found by Carlson and Levy (1973) to be significantly less accurate than Intuitive-Perceptive types in interpreting facial expressions of emotions. In addition, DiTiberio (1977) noted that Intuitives were able to more accurately identify covertly

expressed feeling messages although there was no significant difference between them and Sensors on identification of overtly expressed feeling messages.

When Graves and Graves (1973) analyzed feedback among members of a group practicum, they found no significant differences in MBTI types between group practicum members who provided meaningful feedback and members who gave less meaningful feedback. Management training sessions are offered, presumably, to effect change; however, Kellerman's findings (1975), from pre and post tests, indicated that training sessions had no effect on the management/personality (MBTI) styles of department chairmen at Valencia Community College.

Kilmann (1975) noted that a preference for Feeling was correlated with less assertiveness and more cooperation in interpersonal and intrapersonal conflict-handling behavior. Evered (1977) studied organizational activists' personality styles and found that the activists were Intuitives rather than Sensors. Sensors, however, are typical of police officers; the composite type description is ESTJ with ISTJ the second most frequent type (Hanewicz, 1978). The ESTJ pattern was evidenced also, when students in a social psychology class were told to deliberately choose answers that would give other people a favorable impression (Braun, 1965) and the ISTJ pattern has been described by Hogan (1970) as exhibiting "the ethics of social responsibility" since those preferences were associated with

high scores on the Survey of Ethical Attitudes; conversely, preferences for ENFP would reflect "the ethics of personal conscience."

In summary, this section of the literature review has identified five MBTI types associated with specific occupational interests. The majority of psychology students were classified as ENTP, the nursing students ESTJ, the registered nurses both ENFP and ISTJ, and the police officers ESTJ. Most of the literature dealt with preferences rather than total types. For counseling purposes, more type research with the Myers-Briggs Type Indicator appears to be needed.

Performance

In 1964 Michael, Baker and Jones conducted a validity study with freshmen students and concluded that the MBTI failed to show much promise as a predictor of college success. Other investigators (Stricker, Schiffman & Ross, 1965) found that MBTI continuous scores had some ability to predict college performance; however, they noted that adding the Indicator's continuous scores to the Scholastic Aptitude Test and high school rank produced a slight but significant improvement in performance prediction. When Dunning (1971) used MBTI preference scores (instead of continuous scores) to determine types of 218 females at Scripps College, he discovered that a surprisingly large percentage (27%) of the students were classified as INFP and, also, that they were

noticeably underachieving in the humanities.

Since achievement may be influenced by learning set, Meara and Wixon (1970) investigated the influence of set by randomly assigning 93 "General Psychology" students to either a positive or a negative learning set. Students were informed that their MBTI scores indicated that they "would do very well" or they would "not do well" in performing a paired-associate learning task. No significant differences were found.

Millott and Cranney (1976) suggest that most students have been exposed to the ideas of effective study but have not developed practices or skills in using the techniques. When Fretz and Schmidt (1967) compared improvers and nonimprovers in an educational skills course at the University of Maryland, they noticed that the students who improved academically had exhibited a preference for a Judging (J) attitude. Also, the Judgers at Kansas State University used study skills and attitudes more than did the Perceivers (P) who had taken skills classes (Robyak & Patton, 1977). In 1972 Griesen stated that there was a significant negative correlation between JP and measures of academic achievement in the medical education "regular curriculum" at Ohio State University. Also, performance on both subscales and total nursing state board scores (N = 312) showed a relationship with MBTI personality types although no one type performed consistently higher or consistently lower (Williams, 1976). In an individualized high school physics

program, DeKock (1972) found no significant differences among MBTI personality types in regard to program test scores or rate of progress. Nevertheless, after analyzing measures of GPA, IQ, science achievement and aptitude of high school students, Reynolds and Hope (1970) commented that the Intuition (N) scale may well be a moderating variable for success in science. Achievement in mathematics, however, was significantly higher for a group of eighth-grade Florida students who were classified by the MBTI as Sensing (May, 1971).

According to Blosser (1972), the instructional procedure of questioning appears to be a skill that can be developed through instruction and practice. When she evaluated such skill in prospective secondary school science teachers, she concluded that the development of questioning skill did not appear to be limited by MBTI personality type. In another study involving the acquiring of questioning skills (Johnson, 1972), preservice elementary social studies teachers who had been divided into high Extraverts and low Extraverts, on the basis of their MBTI scores, showed no significant difference in their questioning ability.

The Extraversion-Introversion dimension of the MBTI was found to be correlated with originality in a sample of 320 school children (Anderson & Cropley, 1966). Intuition was consistently present in Mills College creative women and in their brothers and sisters (Helson, 1968). Creativity in

a nationwide sample of 62 architects was correlated (.42) with the MBTI (Hall & MacKinnin, 1969) but there was no correspondence across creativity (as measured by divergent thinking) and the MBTI scores of 90 undergraduates at a New York state university (Ohnmacht, 1970). According to Fishbein (1975), growth in creativity, critical thinking and open-mindedness was promoted by assignment of 359 Miami-Dade Community College students in English and social science classes to small groups on the basis of MBTI complementarity.

Instructor-student MBTI compatibility was associated with higher grades in freshman English classes at Duke University (Garrison, 1970). At Berkeley, similarity of MBTI type in the client-counselor relationship had a drawback: the clients who failed to appear for their counseling sessions were significantly more similar to their counselors in terms of their MBTI profiles (Mendelsohn & Geller, 1967). Similarity of personality (as established by the MBTI) was not determined to be a factor in the counseling relationship when the interaction was between black or white counselors and black students (Peters & Slaughter, 1973); the individuality of the counselor was thought to have the greatest influence on the counseling outcome.

In summary, the chronologically oldest study in this review section reflects doubt on the use of the Myers-Briggs Type Indicator as a predictor of performance. Six later

studies found no significant differences among MBTI personality classifications and performance; however, there were fourteen research studies which did report statistically significant differences among the MBTI preferences and types compared with levels of performance. Accordingly, the MBTI appears to have use as a predictor of performance.

Evaluation

General References

In 1970 Rowland declared that effort and cooperation can make measurement of college teaching less haphazard and subjective. Nevertheless, no academic issue is more controversial than the evaluation of teaching effectiveness (Ellis & Rickard, 1977). One reason for the controversy is that no precise definition of teaching would find universal acceptance (Doyle, 1975). Also, there are problems in that faculty activities, assignments and instructional styles are extremely varied; therefore, there is considerable debate in arriving at the contents of an evaluative instrument (Wotruba, 1975).

A total evaluation package may provide for administrative, peer and student ratings. Although Doyle (1975) notes that there is some similarity in the three measures of performance, he feels that there is not enough similarity to substitute one rating for the other. If one rating is to be eliminated, however, Ellis and Rickard (1977) would recommend that it be the peer evaluation since

they found that peer evaluation proved to have little face validity.

Student ratings, on the other hand, provide a reliable, convenient, useful and probably valid method for evaluating teacher performance (according to a consensus of the literature reviewed by Kulik and Kulik, 1974). Also, student ratings should be considered in the evaluation procedure because students are the consumers of the educational programs (Renner, 1967; Miller 1972).

Although many administrators believe that student evaluation of instruction is useful (Morton, 1965; Kulik & Kulik, 1974; Doyle, 1975) and should provide input into the decisions on retention and tenure (Eble, 1972), faculty often question the motivation for the evaluations (Doyle, 1975). As Nation, LeUnes and Gray (1976) emphasize, student evaluation of teaching is the most common method for controlling teacher behavior. Furthermore, faculty have doubts about how the results will be used (Gross & Small, 1979); for example, if a teacher's ratings are unsatisfactory, the teacher could be guided into adaptive behaviors or could be fired. If the ratings are satisfactory (or better), the resulting status could count in the institution's reward system (Eble, 1972) or could generate unwanted assignments, such as problem courses and heavier loads; thus the "reward" of satisfactory ratings can become a "punishment" (Doyle, 1975).

The evaluation problem might be resolved through

voluntary participation by faculty; however, Schafer (1971) declares that a volunteer program will not achieve the objectives of a sound evaluation procedure. Another solution (since teacher self-improvement is often cited as a rationale for student evaluation of instruction) is to use the rating system only as a teacher improvement model--with the data not forwarded to administration or students; such a procedure is usually perceived as non-threatening and useful by faculty members (Sheehan, 1975). Even if the student evaluation system which is adopted is opposed by faculty, after a few years of experience with the system, most faculty members accept and even praise it (Slobin & Nicholas, 1969). In fact, Gross and Small (1979) found that almost half of the faculty they surveyed felt that student ratings contribute to job satisfaction.

The development of an evaluation process is time-consuming, but willingness to spend the time to resolve the political and developmental problems is necessary (Fenker, 1975). According to Schafer (1971), the criteria for good teaching should be developed by all concerned groups: teaching faculty, administrators and students. Although Doyle (1975) states that the qualities that are needed for the evaluation information are reliability, validity, generalizability and utility, he also believes that even a poorly constructed rating scale is sufficiently reliable for course improvement purposes. Ballard, Rearden and Nelson (1976) agree that rating instruments are reliable and

teachers are scaleable on at least one dimension: student opinion. Nevertheless, Owen (1976) questions the validity of student ratings of instruction and proposes a moratorium on student ratings as evaluative measures until existing instruments are refined. Recently (1979), Aversano and Feldhusen reported that the Endeavor Instructional Rating Form (ERIF) and the Purdue Instructor and Course Appraisal: CAFETERIA System appear to be useful and interpretable--regardless of the instructional model used.

The usual rating procedure provides for an anonymous evaluation form (Morton, 1964; Doyle, 1975). However, some studies have found no significant difference between the data for an anonymous form and a form identified by name (Doyle, 1975; Whitney, G., see Appendixes G and H). According to Morton (1965), the teacher should be absent when the rating form is distributed; both Kirchner (1969) and J. Whitney (1978) found that student ratings were higher when the instructor administered the student evaluation form. Although Doyle (1975) concedes that it is acceptable for the teacher to conduct the evaluation if he expresses his usual demeanor, Morton (1964) advises that the rating forms should be collected by an administrator who keeps them until grades have been assigned and then returns them to the instructor.

Doyle (1975) believes that it matters little which course is selected for evaluation--if the teacher has experience with the course and no recent major changes have been made but other educators disagree. In 1961 Gage

reported that some factors (such as low level, required, greater-than-30 enrollment courses) were associated with lower student ratings; therefore, he stressed that teachers who were assigned to those courses shouldn't be penalized for factors over which they had no control. Kulik and Kulik (1974) expanded the list of factors which determine student ratings of teaching skill and Sheehan (1975) pointed out that such factors contribute to invalidity if student ratings are used for administrative personnel decisions.

The time chosen for the evaluation procedure is another factor to be considered. Doyle (1975) recommends that students have a whole term's experience with the course. He also advises against providing rating forms during an examination; however, one study (Whitney, G., 1978) found no significant difference between student ratings made on examination and non-examination days. Also, knowledge of final grade did not significantly affect the student ratings of instruction reported by Frey (1976) and Yates and Karmos (1977).

Students' expectations about a course and instructor may be related to ratings that they assign. Doyle (1975) reported that students who received lower grades than they expected rated 10 of 19 categories on an evaluation form lower than did those students who got their expected grades. Snyder and Clair (1976) found that the lower the expected grade or the higher the obtained grade the more favorable the teacher evaluation appeared; they also disclosed that

A students attributed their performance more to themselves whereas C students attributed their performance more to the teacher. Bock (1979) verified that students whose expectations coincided with the course content where more likely to rate the instructor as highly effective or effective whereas students who had expected a different type of course were more likely to rate the instructor as effective or ineffective.

Student performance appears to be associated with the levels of ratings that are given to instructors. Brown (1976) noted that an average student grade was the best predictor of an average student rating of the teacher. Several studies (Ellis & Rickard, 1977; Costin, 1978; Bolton, Bonge & Marr, 1979) found that classes which perform better rate the instructor higher; those studies also indicated that classes taught by more highly rated teachers showed higher achievement. Hoffman (1979) interprets the findings by declaring that highly rated teachers are more effective: their students receive higher grades because they learn more in those teachers' classes. Bolton, Bonge and Marr (1979) established that highly rated teachers of general psychology also rated higher on preparation and rapport with students--a departmental benefit because a higher proportion of the students in those classes enrolled in subsequent psychology classes. Perhaps highly rated teachers also make their classes more interesting; when Jordan (1979) surveyed faculty she found that the highly rated teachers tended to agree that

it is their teaching responsibility to make the subject matter interesting to students.

MBTI References

The Vocational Rehabilitation Agency conducted a study in 1968 to provide an empirical basis for counselor-client compatibility matching procedures; evaluation revealed that achievement of counseling objectives depended more on cognitive, problem-oriented, goal-directed activities than personality as measured by the MBTI. Another study (Thompson, 1969) disclosed that clients who had been rated by secondary school counselors as ideal clients, had MBTI preferences similar to their counselors. The investigation also found that ideal clients had higher grade point averages and rated the value of counseling higher. Taylor (1969) stated that students in six "Human Development" classes did not undervalue opposite psychological types of teachers and when Blank (1970) analyzed 297 undergraduate engineering students' ratings of their instructors, the data showed no significant differences in student ratings among different MBTI types.

Hart and Driver (1978) hypothesized that students would perceive teachers who were more like them in MBTI personality as being more effective; however, student ratings did not support the hypothesis. As a method for predicting counselor effectiveness, Lester (1971) rated empathy scores of subjects before they received suicide

prevention and crisis training. Results indicated that the subjects who had higher empathy scores relied more on MBTI Judgmental than Perceptive processes. When the Rehabilitation Counselor Rating Scale was used to evaluate counselors and the MBTI was employed to gain measures of the counselors' personalities, it was not possible to identify the highly rated rehabilitation counselors from the low rated, nor was it possible to discern the rehabilitation counselors with a record of high case closure versus low case closure (Hilliard, 1973). Although McGinn (1976) stated that non-academic accomplishment of talented adolescents couldn't be predicted by the MBTI, he said that the results of the MBTI were evaluated as understandable and generally acceptable to gifted students; he expressed his opinion that the MBTI is useful for students, counselors and researchers.

In summary, the majority of research findings do not show evidence of a relationship between MBTI personality types and evaluation results. Therefore, the Myers-Briggs Type Indicator appears to be a better predictor for measures of performance than for purposes of evaluation.

The next chapter presents the methodology that was used to investigate "General Psychology I" students' achievement (performance) and course satisfaction (evaluation of the course and instructor) compared with their personality types as described by the Myers-Briggs Type Indicator.

Chapter 3

RESEARCH DESIGN AND METHODOLOGY

Course

The course described in this study was "General Psychology I" (identified as PSY 2013): a survey of the scientific field of psychology--including learning, motivation, emotion, human development, personality, psychopathology and therapy techniques (see BCC Catalog, 1979-1981). The textbook used was Introductory Psychology by Johnathan L. Freedman (1978). A Study Guide for General Psychology (Whitney & Whitney, 1978) was also employed; it contained five learning modules consisting of learning objectives, instructional materials, self-tests and self-test answers. For additional information about the structure of the course, see Appendix J.

Sample Group

Subjects were selected from the Brevard Community College students who were attending "General Psychology I" during the winter term of 1979; enrollment had not been restricted by any course prerequisite or entrance level assessment testing. The target group was comprised of PSY 2013 students registered in eight sections: 01C, 02C, 04C, and 08C taught by James Whitney on the Cocoa Campus plus 01M,

02M, 03M and 04M taught by Gloria Whitney on the Melbourne Campus. Those particular class sections were chosen because all the students were being exposed to the same highly-structured course methodology designed through the collaboration of the previously cited instructors. All eight classes met on Mondays, Wednesdays and Fridays for 50 minute sessions during the winter (0179) term of 1979. The Cocoa class times were 8:00 A.M., 9:00 A.M., 10:00 A.M. and 12:00 noon. The Melbourne sections also were day classes; they met at 9:00 A.M., 10:00 A.M., 12:10 P.M. and 1:10 P.M. respectively. There were a total of 282 students registered for the eight aforementioned classes (see Table 1).

Table 1

Students Registered for PSY 2013

Cocoa Campus		Melbourne Campus	
Section	N	Section	N
01C	40	01M	40
02C	40	02M	39
04C	38	03M	40
08C	24	04M	21
Sub-Totals	142		140
Total		282	

The sample group was specifically defined as those students who completed the Myers-Briggs Type Indicator (MBTI) personality inventory (see Table 2) and received passing grades (A through D) in the "General Psychology I" (PSY 2013) course (see Table 3). Accordingly, there were 211 students in the sample group.

Table 2

Students Who Completed the MBTI

Cocoa Campus		Melbourne Campus	
Section	N	Section	N
01C	33	01M	39
02C	36	02M	38
04C	32	03M	37
08C	21	04M	21
Sub-Totals	122		135
Total		257	

Table 3

Students Who Completed the MBTI and Passed PSY 2013

Cocoa Campus		Melbourne Campus	
Section	N	Section	N
01C	29	01M	35
02C	26	02M	34
04C	25	03M	29
08C	14	04M	19
Sub-Totals	94		117
Total		211	

The W grades were not included in this study because the W classification was a combination category of non-attendance (including voluntary and administrative withdrawals) and non-achievement (assignment of W in lieu of an F).

Although stability in student performance and course satisfaction had been evidenced (see Appendixes A-I) for the writer's classes, it seemed prudent to compare the total sample group (comprised of students of another instructor as well as students of the writer) with data from a comparison group of solely the writer's students. Therefore, a control group closely resembling the sample group was selected from

the writer's 1978 classes. The comparison group students had attended the 1978 winter term of "General Psychology I" sections 01M, 02M, 03M and 04M. The students met for 50 minute class sessions on Mondays, Wednesdays and Fridays at 9:00 A.M., 10:00 A.M., 12:10 P.M. and 1:10 P.M. on the Melbourne Campus. A chi-square test (formula from Snodgrass, 1977, p. 334) was calculated for the passing grades of the designated terms to determine if the expected and observed frequencies of grades were more different than would be attributed to chance. The chi-square value of 1.02 was not significant (see Table 4) since the critical value of X^2 for the 0.05 probability level with 3 degrees of freedom is 7.82 (Snodgrass, 1977, p. 425).

Table 4

Observed and Expected Frequencies of Passing Grades of the Comparison and Sample Groups

Semester		A	B	C	D	Total
0178	fo	34	46	35	12	127
Comparison Group	fe	34.9	42.5	38.3	11.3	
	chi	.02	.29	.29	.04	
0179	fo	59	67	67	18	211
Sample Group	fe	58.1	70.5	63.7	18.7	
	chi	.01	.17	.17	.03	
Total		93	113	102	30	338

$$X^2 = \Sigma \frac{(fo - fe)^2}{fe}$$

$X^2 = 1.02$ $\quad df = 3$ $\quad p > 0.05$

During the last week of classes (before make-up and retake sessions) an evaluation form (see Appendix K) was distributed to gather information on PSY 2013 course satisfaction. The ratings of the over-all course were tallied and the results are displayed in Table 5.

Table 5

Frequencies of Ratings of Over-all Course

Semester	Poor = 1	2	3	4	5 = Good	Total
0178	0	0	4	35	66	105
0179	1	1	5	67	126	200
Total	1	1	9	102	192	305

Chi-square testing was employed by using the formula by Snodgrass (1977, p. 334) and applying Yates' correction for continuity (Hardyck & Petrinovich, 1969, p. 165). Since expected cell frequencies were too low (according to Snodgrass, 1977) to use all five steps of the rating scale, categories 1 through 4 were combined. As depicted in Table 6, the resulting X^2 value of 0.00 indicated that over-all ratings of the course given by the sample (0179) and comparison (0178) groups showed no significant difference.

Table 6

Observed and Expected Frequencies of Course Ratings by Comparison and Sample Groups

Semester		Ratings: 4 or less	Ratings: 5	Total Ratings
0178	fo	39	66	105
Comparison Group	fe	38.9	66.1	
	chi	.00	.00	
0179	fo	74	126	200
Sample Group	fe	74.1	125.9	
	chi	.00	.00	
Total Ratings		113	192	305

$$X^2 = \Sigma \frac{(fo - fe - .5)^2}{fe}$$

$X^2 = 0.00$ $\quad df = 1$ $\quad p > 0.05$

Student's ratings of the over-all instructor were then tallied. Table 7 presents the frequencies for each of the rating scale categories.

Table 7

Frequencies of Ratings of Over-all Instructor

Semester	Poor = 1	2	3	4	5 = Good	Total
0178	0	0	2	16	86	104
0179	1	1	0	34	164	200
Total	1	1	2	50	250	304

When chi-square testing was utilized to determine if the ratings of the instructor were more different than would be attribituted to chance, no significant difference was found between the comparison and sample groups (see Table 8).

Table 8

Observed and Expected Frequencies of Instructor Ratings by Comparison and Sample Groups

		Ratings		
Semester		4 or less	5	Total Ratings
0178	fo	18	86	104
Comparison Group	fe	18.5	85.5	
	chi	.00	.00	
0179	fo	36	164	200
Sample Group	fe	35.5	164.5	
	chi	.00	.00	
Total Ratings		54	250	304

$$X^2 = \Sigma \frac{(fo - fe - .5)^2}{fe}$$

$X^2 = 0.00$ $\quad df = 1$ $\quad p > 0.05$

In summary, there were no significant differences between the sample group and the comparison group in measures of grades, ratings of the course and ratings of the instructor. By referencing Tables 4, 6 and 8 the writer judged that the 1979 sample group was not atypical.

Personality Inventory

Description of the MBTI

The personality instrument chosen for this study was the Myers-Briggs Type Indicator, Form F. The MBTI was developed by Isabel Briggs Myers and her mother Katharine Cook Briggs, over a period of 30 years (CAPT, 1979). The purpose of the Indicator, as stated in the 157 page MBTI Manual (Myers, 1962), was to implement Jung's theory of type (1923). The multiple-choice inventory, consisting of 166 items, was constructed to indicate differences in the way normal people prefer to use perception and judgment. The differences are reflected by scores on the four basic preferences: Extraversion or Introversion, Sensing or Intuition, Thinking or Feeling and Judgment or Perception. The preferences determine a person's type. For example, ESTJ indicates preferences for the extraverted, sensing, thinking and judging modes.

Reliability of the MBTI

When Myers discussed reliability (MBTI Manual, 1962), she questioned how much of any given result was contributed

by the reliability of the Indicator and how much was the reliability of the person taking the inventory. She then presented correlations based on split-half reliability data (Spearman-Brown formula). The median reliability for the categories was .81. However, Myers noted that product-moment scores are determined mainly by the more extreme scores; therefore, when tetrachoric r's (sensitive to the middle scores) were used before applying the Spearman-Brown formula to obtain reliability estimates, the median reliability for the categories was .83.

Siegel, in a review of the MBTI presented in the Sixth Mental Measurements Yearbook (1965), noted that limited percentile norms were provided for eight scores (continuous) but the Manual (1962) did not present reliability data for them. Since those scales were only half as long as those for which reliability was estimated, Siegel was dubious about the utility of the percentile conversions for individual guidance. However, he emphasized that the Indicator scores can be minimized if test administrators give primary concern to the type classification rather than the percentile scores.

Another reviewer, Mendelsohn (1965) mentioned that there was little data on the stability of the scores other than the 14-month test-retest study yielding correlations of approximately .70 (according to the Manual, 1962). He stated that, generally, the reliabilities of the test are like those of similar self-report inventories. The TF (thinking-feeling) scores were cited as least stable.

Sundberg (1965) also mentioned the TF scores in particular and stated that the reliability studies were limited to internal consistency measures. He then recommended more studies involving different groups of subjects and periods of time, and a parallel form of the inventory.

There was an MBTI study of black students at Howard University (N = 758); Levy, Murphy and Carlson (1962) reported that their test-retest coefficients for continuous scores on the four major variables were statistically reliable for all dimensions. When an eight week test-retest interval was used by Carkadon (1977) at Mississippi State University, reliabilities were found to be generally satisfactory (r's from .73 to .87) with the exception of scores for males on the TF scales (r = .56). Although a parallel form of the MBTI has not been constructed, a revised form of 125 items (Form G) has been developed (Supplementary Manual, 1977).

In 1977 an extensive assessment of the MBTI was conducted by Carlyn. She concluded that the Myers-Briggs Type Indicator is an adequately reliable instrument.

Validity of the MBTI

Data from a wide range of validity studies is presented in the Manual (1962). There are MBTI correlations with tests of personality, interests, values and needs. One investigation was made because Myers (1962) assumed that both the MBTI and the Gray-Wheelwright Psychological Type

Questionnaire reflect Jungian opposites. The Gray-Wheelwright lacks a JP (judging-perceptive) scale; otherwise after validity testing, Myers suggested that both tests reflect exactly the same things. Another personality test, the Personality Research Inventory, was given to 507 Cornell freshmen engineers. All 25 scales of the PRI correlated significantly with one or more of the type indices--49 of the 100 coefficients were significant at the .01 level. MBTI scores of 727 Stanford University male freshmen were correlated with the Strong Vocational Interest Blank; 103 of the 180 correlations were significant beyond the .01 level. The MBTI also correlated with values, as measured by the Allport-Vernon-Lindzey Study of Values (N = 1371); two-thirds of the 24 correlations were significant at the .01 level. Additionally, a correlation with needs was demonstrated. Of the 60 correlations between the MBTI and the Edwards Personal Preference Schedule (N = 236 Wesleyan male freshmen), 24 were significant at the .01 level. The Manual (1962) also includes correlations of the MBTI with non-test variables such as faculty ratings of student characteristics, turnover in utility jobs, and creativity.

External reviewers of the Indicator have conducted further testing of the instrument and offered recommendations. For example, Mendelsohn (1965) supported the use of the MBTI for research and counseling if the scores are interpreted according to their empirical relationships rather than their assumed theoretical significance. Sundberg

(1965) stated that suggested interpretations of the types are easy to use but noted that evidence was needed that the descriptions differentiate and individualize persons. Carlyn (1977) agreed that additional studies were needed; however, after conducting an evaluation of the MBTI, she stated that the Myers-Briggs Type Indicator has moderate predictive validity in certain areas.

Considerations for MBTI Use

The MBTI is easy to administer and Form F items are readily answered within 50 minutes (Sundberg, 1965). The MBTI is also easy to score (Sundberg, 1965); however, hand-scoring the Indicator is time-consuming (e.g., eight lay-over keys are needed for scoring each answer sheet). Additional time is needed, also, if preference strengths are plotted on the Report Form designed by Myers (1976). If funds are available, computer-scoring is an alternative method. The Center for Applications of Psychological Types, Inc. (CAPT) offers computer-scoring services ranging from basic scoring to additional optionals--such as a Scoring Breakdown (described as a step toward individualizing MBTI reports). Users of the CAPT computer-scoring service have contributed to a CAPT data bank which has been used to create normative populations showing type distributions (displayed in type tables) and to conduct research on the psychometric properties of the MBTI (CAPT, 1979).

In 1965 in the Sixth Mental Measurements Yearbook

(p. 322), Mendelsohn stated that the Indicator had considerable potential utility; he said, "Although there are better predictors available for particular tasks, few instruments appear to provide as much information as can be derived efficiently from the MBTI." Apparently, many researchers agree with Mendelsohn--there were 482 references listed in the Myers-Briggs Type Indicator Bibliography distributed by CAPT in 1979.

MBTI Personality Types

Collection of the Data

There were 282 students registered for the eight classes of "General Psychology I" (PSY 2013) selected for investigation during the winter semester (January through April) of 1979 at Brevard Community College (see previously presented Table 1). In preparation for data recording, each student's name was written on an individual 3" X 5" card. Then, during the second week of classes, the Myers-Briggs Type Indicator (Form F) was administered; 257 students completed the inventory (see Table 2) and received 2 class activity points (of a possible 23 activity points available within the 160 total possible course grade points--see Appendix L). After the Indicator answer sheets were hand scored, the resulting MBTI personality types were recorded on the 3" X 5" cards. At the end of the semester, the students' course grade point totals (and equivalent letter grades) were recorded. The cards were then sorted to select the sample

group (the 211 students who had completed the MBTI and passed the course--see Table 3). The sample group was further divided into the 16 MBTI personality type categories; the numbers of students in each category were tallied to obtain the BCC distribution of MBTI types. The CAPT frequencies of the MBTI types found in a group of college freshmen (N = 11,122) were presented by Carskadon (1977) from information provided by the Center for Applications of Psychological Types, Inc.

Treatment of the Data

The BCC frequencies of MBTI types were displayed in type table form. Then both the BCC sample (N = 211) of MBTI types and the CAPT group (N = 11,122) of MBTI types of college freshmen were converted to percentages for tabular comparison. Finally, a chi-square test (formula from Snodgrass, 1977) was calculated to test the following hypothesis:

H2 There is no significant difference between the observed Brevard Community College frequencies of the Myers-Briggs Type Indicator personality types and the expected frequencies for a sample of 211 college freshmen.

Types Compared with Achievement and Satisfaction

Collection of the Data

At the end of the winter semester of 1979, student

achievement was measured by the total (of a possible 160) grade points that each student earned on five "General Psychology I" criterion-referenced tests taken during the semester. Performance was recorded on 3" X 5" cards.

Student satisfaction was measured by the use of a course and instructor evaluation form (see Appendix K). On the last regularly scheduled class day, students received the evaluation form along with a grade report indicating the PSY 2013 course grade to be assigned if criterion testing was complete (see Appendix J for make-up and/or retake procedure during the final week). After reviewing the grade report, students were requested to rate the course and instructor.

Following previous procedures (1976 - 1979), only the summary evaluation categories (Over-all Course and Over-all Instructor) were selected for analyses. Summary categories had been suggested by Doyle (1975) who stated that general summary evaluative statements (such as over-all effectiveness) are more useful as a base for making decisions than are specifics, such as instructor trait ratings. Ballard, Rearden and Nelson (1976) also used global ratings in their study on student and peer ratings of faculty. Accordingly, the PSY 2013 students' summary category ratings were recorded for analyses.

Treatment of the Data

A multivariate approach was needed to ascertain if there were any significant differences among the variables

(achievement and ratings among different personality types). Discriminant analysis was recommended (Barton, 1979). This technique provides a method for assigning individuals to groups on the basis of information on the individuals on two or more variables (Kerlinger, 1979). According to Barton (1979), nine of the sixteen Myers-Briggs Type Indicator personality type categories had frequencies sufficient (10 or more) to be included in the discriminant function analysis which was performed via computer services at Nova University to test the following hypothesis:

H3 There are no significant differences between "General Psychology I" students' course grade points, ratings of the course, and ratings of the instructor among different personality types as described by the Myers-Briggs Type Indicator.

Since seven of the sixteen Myers-Briggs Type Indicator categories, due to low frequencies, had not been part of the discriminant function analysis, the writer questioned whether the seven MBTI types not included in the analysis were atypical from the MBTI types included in the analysis. Therefore, in order to compare the difference between the two independent samples, t - tests were calculated (formula from Snodgrass, 1977) to test the following hypotheses:

H4a There is no significant difference between the "General Psychology I" mean course grade points earned by the Myers-Briggs Type Indicator types included in the discriminant function analysis and the mean course grade points earned by the MBTI types not included in the analysis.

H4b There is no significant difference between the mean rating of the "General Psychology I" course made by the Myers-Briggs Type Indicator types included in the discriminant function analysis and the mean rating of the course made by the MBTI types not included in the analysis.

H4c There is no significant difference between the mean rating of the "General Psychology I" instructor made by the Myers-Briggs Type Indicator types included in the discriminant function analysis and the mean rating of the instructor made by the MBTI types not included in the analysis.

Perceptions of the MBTI

Collection of the Data

After each MBTI answer sheet was scored, each student's performance strengths were plotted and a graph was drawn on a Report Form for Myers-Briggs Type Indicator

(devised by Myers, 1976). In mid-March, on the day of the activity class designated psychological testing, the writer met with each of the eight classes selected for sampling. The MBTI report forms were distributed at the beginning of the class and students were instructed to read the descriptive profile corresponding to their MBTI type. Then a class activity form was handed out (see Appendix M) and students were requested to indicate their perceptions of the accuracy of the Indicator as a measure of their own personality. Also, students were asked to check whether the activity (personality testing and feedback) should be kept as a part of the PSY 2013 course. When the forms were completed they were given to the instructor. The completed forms (along with participation in MBTI experiential activities during the remainder of class time) enabled students to obtain 2 more points (in addition to the 2 points gained for taking the MBTI) toward their final course grade (see Appendix L).

Treatment of the Data

Students' perceptions of the accuracy of the Myers-Briggs Type Indicator were determined by tallying the frequencies of each of the five choices on the activity class form. The choices ranged from "All four preferences seem to be accurate," to "None of the preferences seem to be accurate" (see Appendix M). A tabular presentation was made.

Next, to investigate if perceived accuracy of the

MBTI descriptive profiles varied according to type, the data was reduced to two categories of preference accuracy (all 4 versus 3 or fewer) and then sorted into the sixteen MBTI personality type categories. The resulting classification was displayed in type table form.

Conceiveably, students' perceptions of the accuracy of the Indicator could have been influenced by positive or negative feelings generalized from the PSY 2013 achievement levels being experienced after more than half a semester's attendance in the course. Therefore, through the use of a chi-square test (formula from Snodgrass, 1977) the following hypothesis was tested:

> H7 There is no significant difference in perceived accuracy of the Myers-Briggs Type Indicator between students who receive higher "General Psychology I" course grades (A and B) compared with students who receive lower course grades (C and D).

Finally, the question of the acceptability of the MBTI, as a class activity, was examined (see Appendix M). Student responses were tallied and a table was constructed to depict the results. The results are presented in the next chapter.

Chapter 4

SUMMARY OF FINDINGS

This project at Brevard Community College examined questions associated with "General Psychology I" achievement and course satisfaction compared with personality types, as measured by the Myers-Briggs Type Indicator. The questions were organized into three sections relating to the distribution of MBTI personality types, comparison of MBTI types with achievement and ratings, and perceptions of the MBTI.

MBTI Personality Types

Research Question 1

What frequencies of the 16 MBTI types appeared in the BCC sample group?

In the sample group of 211 Brevard Community College students enrolled in "General Psychology I" (PSY 2013), all 16 Myers-Briggs Type Indicator personality types were represented, albeit not equally. When the types were arranged from largest to smallest frequencies, the following list resulted: ENFP (N = 38), INFP (N = 25), ESFP (N = 21), ISFP and ESFJ (N = 18), ENFJ (N = 17), ISFJ (N = 15), ISTJ (N = 12), INTP (N = 10), ESTJ (N = 9), INFJ and ISTP (N = 7), INTJ and ESTP (N = 5), ENTJ (N = 3), and ENTP (N = 1).

Accordingly, it can be seen that the frequencies in the MBTI type categories ranged from 38 persons (ENFP) to 1 person (ENTP) with a median frequency of 11. All 211 frequencies are displayed in Type Table format in Table 9.

Table 9

Frequencies of MBTI Types in the BCC Sample Group
N = 211

ISTJ 12	ISFJ 15	INFJ 7	INTJ 5
ISTP 7	ISFP 18	INFP 25	INTP 10
ESTP 5	ESFP 21	ENFP 38	ENTP 1
ESTJ 9	ESFJ 18	ENFJ 17	ENTJ 3

Research Question 2

Were BCC frequencies of MBTI types different from the normative pattern for college freshmen?

The BCC frequencies (N = 211) of Myers-Briggs Type Indicator personality types were converted to percentages for tabular comparison with the CAPT (Center for Applications of

Psychological Types, Inc.) frequencies (N = 11,122) of MBTI types in college freshmen (reported by Carskadon, 1977). The largest category for both groups was the ENFP type; it was also the classification that showed the greatest difference between the groups when the percentages were compared--BCC had 18.01% whereas CAPT had 12.71% of the students designated ENFP. The second largest difference was in the ESFJ category where BCC had only 8.53% compared with 12.49% of the students in the CAPT normative group. The least amount of percentage difference found was that of the ESTP classification (BCC had 2.37% and CAPT had 2.65%). For a complete breakdown of percentages of MBTI types in both groups, see Table 10.

Table 10

Percent Frequencies of the MBTI Types in the BCC Sample Group (N = 211) and in the CAPT Group (N = 11,122)

	ISTJ	ISFJ	INFJ	INTJ
BCC	5.69%	7.11%	3.32%	2.37%
CAPT	6.81%	9.77%	4.02%	2.81%
	ISTP	ISFP	INFP	INTP
BCC	3.32%	8.53%	11.85%	4.74%
CAPT	2.69%	6.47%	9.12%	3.15%
	ESTP	ESFP	ENFP	ENTP
BCC	2.37%	9.95%	18.01%	.47%
CAPT	2.65%	6.93%	12.71%	3.51%
	ESTJ	ESFJ	ENFJ	ENTJ
BCC	4.27%	8.53%	8.06%	1.42%
CAPT	7.85%	12.49%	5.83%	3.20%

Note: Both groups' percentages total 100.01% due to rounding

Hypothesis 2. There is no significant difference between the observed Brevard Community College frequencies of the Myers-Briggs Type Indicator types and the expected frequencies for a sample of 211 college freshmen.

A chi-square test was calculated to determine if the observed and expected frequencies of BCC types (N = 211) and a sample of 211 college freshmen derived from the norms (N = 11,122) established by CAPT, were more different than would be attributed to chance. The expected frequencies (see Table 11) were obtained by multiplying 211 by each of the CAPT percentage values in Table 10. The calculated value of X^2 was 30.63. Since the critical value of X^2 for the 0.05 probability level with 9 degrees of freedom is 16.92 (Snodgrass, 1977), the null hypothesis was rejected. The two groups were significantly different at greater than the 0.05 level.

Table 11

Observed BCC Frequencies of MBTI Types Compared with Expected Frequencies for a Sample of 211 College Freshmen

	MBTI Type Categories				Total
	ISTJ	ISFJ	INFJ	INTJ	
fo	12	15	7	5	39
fe	14.4	20.6	8.5	5.9	
chi	.40	1.52	.26	.14	
	ISTP	ISFP	INFP	INTP	
fo	7	18	25	10	60
fe	5.7	13.7	19.2	6.6	
chi	.30	1.35	1.75	1.75	
	ESTP	ESFP	ENFP	ENTP	
fo	5	21	38	1	65
fe	5.6	14.6	26.8	7.4	
chi	.06	2.81	4.68	5.54	
	ESTJ	ESFJ	ENFJ	ENTJ	
fo	9	18	17	3	47
fe	16.6	26.4	12.3	6.8	
chi	3.48	2.67	1.80	2.12	
Total	33	72	87	19	211

$$X^2 = \Sigma \frac{(fo - fe)^2}{fe}$$

$X^2 = 30.63$ $\quad df = 9$ $\quad p < 0.05$

Types Compared with Achievement and Satisfaction

Research Question 3

Were there significant differences in student achievement and course satisfaction among different personality types?

Information was compiled on student achievement and satisfaction by noting each student's grade points earned in PSY 2013, rating of the course and rating of the instructor. Individual data was then recorded by MBTI type categories. Appendix N displays the data (N = 200) which was complete for all aforementioned variables.

Hypothesis 3. There are no significant differences between "General Psychology I" students' course grade points, ratings of the course, and ratings of the instructor among different personality types as described by the Myers-Briggs Type Indicator.

Discriminant analysis was the statistical technique utilized to analyze the data since it can be used to contrast two or more groups on more than one dependent variable. Students were grouped into MBTI personality types to contrast the 16 types with the three dependent variables (grade points, course ratings and instructor ratings). The following nine MBTI categories (total N = 164) had dependent variable frequencies judged sufficient (10 or more) to be used in a discriminant analysis (Barton, 1979): ISTJ, ISFJ,

ISFP, INFP, INTP, ESFP, ENFP, ESFJ and ENFJ. The analysis was performed by Nova University's computer center, employing the University of Pittsburg SPSS-10 program. A summary of the results is presented in Table 12.

Table 12

Summary of Discriminant Analysis of MBTI Types Compared with Grade Points, Course Ratings and Instructor Ratings

Discriminant Function	Relative Percentage	Wilks' Lambda	Chi-Square	df	Significance
1	64.24	0.8211	30.756	24	0.161*
2	22.87	0.9301	11.308	14	0.662*
3	12.89	0.9740	4.102	6	0.663*

* $p > 0.05$

No combination of the three dependent variables (grade points, course ratings or instructor ratings) significantly discriminated at the 0.05 level among the nine previously identified Myers-Briggs Type Indicator personality types. Accordingly, the null hypothesis cannot be rejected. There were no significant differences between "General Psychology I" students' course grade points, ratings of the course, or ratings of the instructor among the different personality types described by the Myers-Briggs Type Indicator.

The only statistically significant ($p < 0.05$)

relationship found was the correlation (r = .55) between ratings of the course and ratings of the instructor (see Table 13).

Table 13

Correlation Matrix

	Grade Points	Ratings	
		Course	Instructor
Grade Points	1.0000		
Course Ratings	0.2080	1.0000	
Instructor Ratings	0.2330	0.5459	1.0000

Research Question 4

Were the MBTI types included in the discriminant function analysis atypical from the MBTI types not included in the analysis?

Of the 211 students in the sample group, 200 had data recorded on their grade points, ratings of the course and ratings of the instructor (see Appendix N). There were 164 students in the nine MBTI categories that were included in the discriminant analysis and 36 students who were not included because their types (INFJ, INTJ, ISTP, ESTP, ENTP, ESTJ and ENTJ) had dependent variable frequencies less than 10. To test the difference between the independent sample

means ($N_1 \neq N_2$ formula from Snodgrass, 1977), t tests were calculated.

Hypothesis 4a. There is no significant difference between the mean "General Psychology I" course grade points earned by the Myers-Briggs Type Indicator types included in the discriminant function analysis and the mean course grade points earned by the MBTI types not included in the analysis.

The grade points earned by the group of MBTI types included in the discriminant analysis ranged from 97 to 157 points (of a possible 160), with a mean of 131.34 points and a standard deviation of 13.92. The grade points earned by the group of MBTI types not included in the discriminant analysis ranged from 108 to 156 points, with a mean of 132.33 and a standard deviation of 13.88 points. The t test yielded 0.35 (the statistical calculations appear in Appendix O). With 198 degrees of freedom the critical value of t at the 0.05 level of significance is 1.96 (Snodgrass, 1977). Since the calculated value of t does not exceed the critical value of t, the null hypothesis cannot be rejected; there is no significant difference between the mean grade points earned by the MBTI types included in the discriminant function analysis and the mean course grade points earned by the MBTI types not included in the analysis.

Hypothesis 4b. There is no significant difference

between the mean rating of the "General Psychology I" course made by the Myers-Briggs Type Indicator types included in the discriminant function analysis and the mean rating of the course made by MBTI types not included in the analysis.

The course ratings given by the group of MBTI types included in the discriminant analysis ranged from 1 point to 5 points (of a possible 5), with a mean of 4.58 points and a standard deviation of 0.60. The course ratings given by the group of MBTI types not included in the discriminant analysis ranged from 2 to 5 points, with a mean of 4.58 and a standard deviation of 0.70 points. The *t* test yielded 0.00 (the statistical calculations appear in Appendix P). With 198 degrees of freedom the critical value of *t* at the 0.05 level of significance is 1.96 (Snodgrass, 1977). Since the calculated value of *t* does not exceed the critical value of *t*, the null hypothesis cannot be rejected; there is no significant difference between the mean rating of the course by MBTI types included in the discriminant function analysis and the mean course rating by the MBTI types not included in the analysis.

Hypothesis 4c. There is no significant difference between the mean rating of the "General Psychology I" instructor made by the Myers-Briggs Type Indicator types included in the discriminant function analysis and the mean rating of the instructor by the MBTI types not included in the analysis.

The instructor ratings made by the group of MBTI types included in the discriminant analysis ranged from 1 point to 5 points (of a possible 5), with a mean of 4.81 points and a standard deviation of 0.48. The instructor ratings made by the group of MBTI types not included in the discriminant analysis ranged from 2 to 5 points, with a mean of 4.72 and a standard deviation of 0.62 points. The t test yielded 0.90 (the statistical calculations appear in Appendix Q). With 198 degrees of freedom the critical value of t at the 0.05 level of significance is 1.96 (Snodgrass, 1977). Since the calculated value of t does not exceed the critical value of t, the null hypothesis cannot be rejected; there is no significant difference between the mean rating of the instructor made by the MBTI types included in the discriminant function analysis and the mean rating of the instructor by MBTI types not included in the analysis.

Perceptions of the MBTI

Research Question 5

How did students feel about the accuracy of the MBTI descriptive profiles?

The perceived accuracy of the MBTI descriptive profiles was assessed through students' ratings checked on class activity forms (see Appendix M). Among the 211 ratings collected there were 203 usable forms and eight unusable (no response to the accuracy item). Generally, the

Myers-Briggs Type Indicator descriptive profiles were perceived to be accurate; 81% of the students reported that all four MBTI preferences seemed to be accurate. Not any of the students checked that none of the preferences seemed to be accurate (see Table 14).

Table 14

Perceived Accuracy of the MBTI

No. of the MBTI Preferences Perceived Accurate	No. of Students Rating the Accuracy of MBTI	% of Students Rating the Accuracy of MBTI
4	164	81%
3	31	15%
2	6	3%
1	2	1%
0	0	0%
Total	203	100%

Research Question 6

Did perceived accuracy of the MBTI descriptive profiles vary according to type?

The perceived accuracy items were grouped into two classifications to display the number (and percentage) of students in each MBTI type category who rated all four MBTI preferences (indicated on their descriptive profiles) as

accurate and the number of students who rated three or fewer preferences as accurate. As shown by Table 15, 100% of the ENFJ (N = 15), ENTJ (N = 3) and ENTP (N = 1) types rated all four preferences as accurate. A high percentage of types ESFP (94%), ENFP (89%) and INFJ (86%) also rated all four preferences as accurate. Although the ESTP group had the lowest percentage (40%) who rated all four preferences as accurate, there were only five people in that type category. Data for all MBTI types can be seen in Table 15.

Table 15

Perceived Accuracy of the MBTI Preferences
Among Differing MBTI Types
N = 203

Accuracy of the Preferences	MBTI Types			
	ISTJ	ISFJ	INFJ	INTJ
All 4	N= 9 %=75	N=11 %=79	N= 6 %=86	N= 3 %=75
3 or fewer	N= 3 %=25	N= 3 %=21	N= 1 %=14	N= 1 %=25
	ISTP	ISFP	INFP	INTP
All 4	N= 5 %=83	N=14 %=78	N=17 %=68	N= 7 %=70
3 or fewer	N= 1 %=17	N= 4 %=22	N= 8 %=32	N= 3 %=30
	ESTP	ESFP	ENFP	ENTP
All 4	N= 2 %=40	N=17 %=94	N=34 %=89	N= 1 %=100
3 or fewer	N= 3 %=60	N= 1 %= 6	N= 4 %=11	N= 0 %= 0
	ESTJ	ESFJ	ENFJ	ENTJ
All 4	N= 6 %=67	N=14 %=78	N=15 %=100	N= 3 %=100
3 or fewer	N= 3 %=33	N= 4 %=22	N= 0 %= 0	N= 0 %= 0

Research Question 7

Did students who demonstrated different achievement levels have differing perceptions of the accuracy of the MBTI?

The 203 usable class activity forms had been grouped into the two classifications: those students who checked that all four MBTI preferences were accurate (N = 164) and those students who checked that three or fewer preferences were accurate (N = 39). In order to compare the higher with the lower PSY 2013 achievement levels, the class activity forms were then separated according to students' final grade categories (A and B versus C and D). There were 121 students who had earned A and B grades and 98 of them felt that all four preferences were accurate. Of the 82 students who earned C and D grades, 66 of them checked all four preferences.

Hypothesis 7. There is no significant difference in perceived accuracy of the Myers-Briggs Type Indicator between students who receive higher "General Psychology I" course grades (A and B) compared with students who receive lower course grades (C and D).

To compare perceived accuracy of the MBTI preferences with achievement level, chi-square testing was employed. The chi-square value was 0.01 (see Table 16). With 1 degree of freedom the critical value of X^2 at the

0.05 significance level is 3.84. Since the calculated value of X^2 does not exceed the critical value of X^2, the null hypothesis cannot be rejected; there is no significant difference in perceived accuracy of the Myers-Briggs Type Indicator between students who received higher "General Psychology I" course grades (A and B) compared with students who received lower course grades (C and D).

Table 16

Grades Compared with Perceived Accuracy of the MBTI Preferences

Accuracy of Preferences		Grades A and B	Grades C and D	Total
All four	fo	98	66	164
	fe	97.8	66.2	
	chi	0.00	0.00	
Three or fewer	fo	23	16	39
	fe	23.2	15.8	
	chi	0.00	0.01	
Total		121	82	203

$$X^2 = \Sigma \frac{(fo - fe - .5)^2}{fe}$$

$X^2 = 0.01$ $\quad df = 1$ $\quad p > 0.05$

Research Question 8

How did students feel about the acceptability of the MBTI as a class activity?

When the sample group of 211 students were asked to indicate their feelings about the acceptability of the Myers-Briggs Type Indicator, by checking whether that psychological testing activity class should be kept as part of the "General Psychology I" course (see Appendix M), 207 students checked "Yes," 2 students checked "No," and 2 made no response. Therefore, it appears that 99% of the students who responded to the item favored the MBTI activity class being retained in the course.

Summary of Results

MBTI Personality Types

In the BCC sample group, the most frequent Myers-Briggs Type Indicator type was ENFP and the least frequent type was ENTP. The ENFP category was also the largest one in the CAPT sample; however, the BCC type pattern was significantly different (at greater than the 0.001 level) from the normative pattern for the CAPT college freshmen.

Types Compared with Achievement and Satisfaction

Although there was a positive correlation ($r = .55$) between ratings of the course and ratings of the instructor, there were no significant differences between "General Psychology I" students' course grade points, ratings of the

course, and ratings of the instructor among the nine MBTI personality types evaluated by a discriminant analysis. Also, there were no significant differences in grade points, ratings of the course, and ratings of the instructor between the group of MBTI types included in the discriminant analysis compared with the group of MBTI types not included in the analysis.

Perceptions of the MBTI

All four MBTI preferences on the descriptive profiles were perceived to be accurate by 81% of the students (100% of students in the ENTP, ENFJ and ENTJ categories). The students' perceptions of the accuracy of the MBTI did not differ according to their course achievement levels. The MBTI also appears to be acceptable to students; 99% of the respondents said it should be retained as an activity class in the "General Psychology I" course.

The next chapter presents discussion, conclusions and recommendations based on the findings which were detailed in this chapter.

Chapter 5

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

This chapter is organized into the same three sections previously used: MBTI personality types, types compared with achievement and satisfaction, and perceptions of the MBTI. Each of these sections presents a discussion of the data, conclusions reached, and recommendations for improvement and further research.

MBTI Personality Types

Discussion

The best standard against which to compare the Brevard Community College pattern of Myers-Briggs Type Indicator personality types would be norms based on other community college students; however, community college data is currently unidentifiable from the university data held in the CAPT computer bank. The normative group most similar to community college students, according to Mary McCaulley (1979), consists of college freshmen (N = 11,122); consequently, in this study, the college freshmen group was used as the comparison base for the MBTI pattern of types.

The modal type frequency for both the BCC and CAPT groups was ENFP. The other frequency rank similarity was that of the INTJ category (see previously presented Table 10). Other types differed to the extent that when the BCC

sample group was statistically compared with a sample of 211 based on the CAPT data, there was a significant difference found at greater than the .001 level (see Table 11). Accordingly, the community college sample was judged to be different from the university sample. Apparently, more community college research with the MBTI is needed, and to fill this need, according to the MBTI Information Bulletin (1980), a consortium for community college data sharing is being formed at Valencia Community College in Orlando, Florida.

The BCC sample group's type categories can also be organized into specific MBTI preferences (see Table 17).

Table 17

MBTI Preferences of Sample Group

	No. of Students		No. of Students
Extraversion	112	Introversion	99
Sensing	105	Intuitive	106
Thinking	52	Feeling	159
Judging	86	Perceptive	125
Total No. of Students	211		

As seen in Table 17, there were more than three times as many preferences for the Feeling function as for the Thinking function--not surprising since one study

found that the Feeling function was preferred by 64% of the Behavioral Sciences majors and 81% of the Education majors at the University of Florida (McCaulley, 1979)--and many of the BCC students had informally commented about their plans for psychology, education or nursing careers. Also, even though one course satisfies the Behavioral Sciences' general education requirement at Brevard Community College, there is a tendency for students to elect several of the Behavioral Sciences courses. Students who are especially interested in psychology, education or nursing occupations often select the "General Psychology I" course first--to ensure meeting the prerequisite for later courses. Accordingly, there may have been a self-selected concentration of Feeling types in the sample group. At this time it is unknown whether the BCC sample's pattern of MBTI types is representative of types in the general student population at BCC.

The attitudes of Extraversion and Perception were preferred over Introversion and Judgment; however, the Sensing and Intuitive functions were nearly equally chosen. About 30% of the sample group indicated preferences for the combination of Intuition, Feeling and Perception. It is interesting to note the individual preferences; however, Siegel (1965) agrees with the Manual's (1962) statement that the most legitimate interpretation of the MBTI is that of type designations. Therefore, this project has primarily focused on types, rather than separate preferences.

Since community colleges attract students of diverse ages, data exchanges through the community college consortium could provide a base for investigations concerning developmental changes in personality. There should be a wealth of data--Jung postulated that people change throughout their lives (McCaulley, 1979). Investigators such as Plant (1962), Minium and Plant (1964), and Grant and Eigenbrod (1970), have reported on MBTI personality changes in young people. Grant and Eigenbrod have also developed a program, using structured peer group activities, to help college students to change or develop their types.

Lundberg (1975) has proposed a theory regarding the developmental aspects of the MBTI. She has delineated a rationale that Extraversion, Sensing, Feeling and Perception are developmentally more primitive than Introversion, Intuition, Thinking and Judgment preferences. Lundberg states that Extraverts and Introverts progress on different tracks and she believes that it is possible for the most primitive types (ESFP and ISFP) to progress on the MBTI hierachy toward the most highly developed types: ENTJ and INTJ. Certainly, her theory has generated controversy among those Indicator users who counsel on the premise that MBTI types differ but reflect equally desirable personal preferences.

Mature type development, as described by McCaulley (1977), implies a knowledge of one's preferences and

development of preferred functions so that they are trustworthy and reliable--with passable development of less preferred functions. There should be a good command (and appropriate use) of both Perception and Judgment. As an illustration, Isabel Briggs Myers has said (according to McCaulley, 1979) that the place to use J is to run one's own life--not to judge others, and one should use P to understand others--not to rationalize lack of organization. One should also be able to function effectively and comfortably in both the Extraverted and Introverted attitudes.

In middle age, the developmental task is to expand the personality (McCaulley, 1979); for example, Intuitives may begin to do crafts and Sensors may be motivated to study the humanities. Therefore, the current trend toward continuing education for adults--"lifelong learning" (BCC Capsule, 1980)--can provide an excellent opportunity for community colleges to conduct longitudinal, as well as cross-sectional, research studies on personality growth and development.

Conclusion

There was a decided difference between the Brevard Community College sample group's pattern of Myers-Briggs Type Indicator personality types and the normative pattern of college freshmen described by the Center for Applications of Psychological Types, Inc. data bank.

Recommendations

Since there was a significant difference in the pattern of MBTI types found in the BCC sample group compared with the CAPT norms, it is recommended that community college norms be established, and identified, separately from the university data. For student advisement purposes, regional and cultural differences among community college districts could also be noted.

It is unknown whether the BCC sample group's pattern of MBTI types is representative of types in the general student population at Brevard Community College. Therefore, it is recommended that further BCC studies be conducted to identify any unique departmental MBTI patterns, as well as to determine the MBTI distribution of types in the general student population at Brevard Community College.

Because community colleges attract students who exhibit a wide range of ages, it is recommended that community college personnel avail themselves of the opportunity to devise and implement age-related research on personality growth and development.

Types Compared with Achievement and Satisfaction

Discussion

In 1978 McCaulley recommended that a Myers-Briggs Type Indicator research project be conducted to study type differences in student satisfaction among medical

specialties, and after researching community college psychology education, Hill (1980) suggested that further studies be conducted to determine instructional practices and styles that are most effective for different student groups. This section of the writer's research project included a modification of those recommendations--a study to determine if there were any significant differences in psychology students' achievement and satisfaction among the MBTI personality types.

When conducting a study of general psychology, Bolton, Bonge and Marr (1979) stated that their first concern was to establish the representativeness of the research sample. The writer began this study by checking the representativeness of the Brevard Community College sample group. When data which had been collected over a period of five semesters was analyzed, historical stability in general psychology achievement and satisfaction was evidenced, and the BCC sample group did not appear to be atypical (see Tables 4 through 8 and Appendixes A through I). Also, the MBTI types included in the discriminant function analysis did not differ significantly (in grade points, ratings of the course, and ratings of the instructor) from the types not included in the analysis. Therefore, the findings should be trustworthy.

Perhaps there was no significant difference between the psychology achievement levels and course satisfaction among differing MBTI personality types because of the

characteristics of the "General Psychology I" instructional system. The course had been especially designed to offer a variety of class presentations and activities to accomodate different learning styles. The system also included behaviorally stated learning objectives and noncompetitive (criterion-referenced) grading. The generally high achievement and satisfaction levels exhibited by the PSY 2013 students correspond to findings reported for other systematized courses. As an illustration, Ostrowski (1977) stated that a behavioral objectives delivery system in child psychology resulted in better student performance plus higher ratings of instruction, and Baker (1975) declared that when he employed behaviorally stated objectives and noncompetitive grading in a tests and measurement course, most students completed the course with a mastery of the basic concepts.

Nevertheless, the writer is concerned about those students who did not complete the psychology course. There could have been a personality bias associated with the withdrawal pattern. For example, of the 46 students who had taken the Indicator but not completed the course, 11 were classified as the ISFP type (see Appendix R). It is conceivable that they were the most dissatisfied students because three out of four of their MBTI preferences differed from the preferences of their instructors (INTJ and ENTP). However, since the nonpersisters were not part of the sample group, definitive withdrawal data was not collected.

Future studies could examine the types of withdrawal (voluntary or administrative), attempt to discern the reasons (such as nonachievement, dissatisfaction, financial, illness) and then compare the frequencies with the differing personality types. If significant differences are found, effective strategies would need to be devised and implemented for any low-achieving or low-satisfaction types.

There is also the possibility that there was no significant difference between the achievement levels and course satisfaction among differing MBTI personality types because achievement and course satisfaction may not be particularly related to personality as described by the Myers-Briggs Type Indicator. Such a position can be supported by the findings of DeKock (1972), who reported that individual MBTI personality types showed no consistency when correlated with test scores in an individualized physics program, and Blank (1970), who found no significant differences in student instructional ratings among MBTI types of students in undergraduate engineering. Accordingly, for comparative purposes, it seems prudent to consider further testing with another personality instrument, such as The Transactive Style Inventory currently being developed. The TSI appears to be uniquely suitable since the personality styles (systemic, analytic, pragmatic, harmonic and catalytic) were, according to the author (Raines, 1979), "derived from a synthesis of the writings of Carl Jung on

personality typology, the research of John Holland on vocational choice, the hierarchy of needs devised by Maslow, and the personality types identified in the Myers-Briggs Type Indicator."

Conclusion

There were no statistically significant differences between general psychology students' achievement levels and course satisfaction among differing personality types described by the Myers-Briggs Type Indicator.

Recommendations

Since the instructional system experienced by the "General Psychology I" persisters appears not be be biased toward particular Myers-Briggs Type Indicator personality types, in regard to achievement levels and course satisfaction, and since achievement was generally high, it is recommended that the instructional system be continued for future Brevard Community College students.

It is recommended that research be conducted to determine if withdrawal patterns in "General Psychology I" indicate a nonachievement or dissatisfaction bias associated with differing MBTI types. If any such bias is found, appropriate counseling and/or instructional strategies should be devised and implemented.

For comparative purposes, it is recommended that further testing be conducted utilizing an additional

personality instrument, such as The Transactive Style Inventory.

Perceptions of the MBTI

Discussion

Although validity of the Myers-Briggs Type Indicator is discussed in the literature, none of the titles listed by the MBTI Bibliography (1979) reflect research on the testees' perceptions of the accuracy of the instrument. In the usual (one-to-one) counseling situation there is ample opportunity to verify the counselee's personality preferences--a counseling procedure emphatically advised by Myers (1962). However, in a classroom (group) setting, due to time constraints, verification presents a problem. Therefore, in this study, students rated the accuracy of their descriptive profiles on the activity class report forms (see Appendix M).

More than four-fifths (81%) of the students believed that all of the profile categories were accurate; only 4% (8 of 203 students) rejected two or more of the four preferences depicted. This high face validity rating, plus the fact that 99% of the students said that the Indicator should continue to be used in the course, is in keeping with previous research which found the MBTI to be nonthreatening (Sundberg, 1965), and well-accepted by students.

While students' ratings of the inventory's acceptability were tabulated by MBTI types (see Table 15), many of the cell frequencies were too small to allow

statistical testing for differences among types. The percentage of students (by MBTI type) who thought that all four preferences were accurate, ranged from 40% to 100%, but, again, because many of the MBTI type categories involved ten or fewer students, it is likely that the reported values possess little reliability.

A statistical (chi-square) test showed that the ratings which students made regarding the accuracy of the instrument did not vary as a function of their achievement levels in the course. The students who received C and D as a final grade found the profile reports as accurate as those students who received A and B grades. From the data analyzed in this study it appears that most of the students valued their experience with the Myers-Briggs Type Indicator.

Conclusions

Most "General Psychology I" students perceived that the Myers-Briggs Type Indicator accurately depicted their personality preferences, and the perceived accuracy did not differ significantly between the students who received higher course grades and the students who received lower course grades. The Indicator was also judged to be acceptable: nearly all students approved the continuance of the MBTI activity class in the psychology course.

Recommendations

Since the Myers-Briggs Type Indicator was perceived

to be accurate, was not biased by achievement level, and was acceptable to students, it is recommended that the Indicator be retained in the "General Psychology I" course as an activity class designed to demonstrate personality testing procedures.

It is also recommended that longitudinal, face validity data among MBTI types be accumulated to provide sufficient Type Table cell frequencies for statistical analysis.

Report Dissemination

When approved by Nova University, this report will be filed with the Dean of Instruction at Brevard Community College. Copies will also be sent to the MBTI Community College Consortium, the Center for Applications of Psychological Type, Inc. and to the U. S. Educational Resources Information Center.

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APPENDIX A

PASSING GRADES 1976 THROUGH 1977

Table 18

Observed and Expected Frequencies of Passing Grades
1976 through 1977

Semester		A	B	C	D	Total
0176	fo	32	61	31	14	138
	fe	39.1	54.4	34.2	10.4	
	chi	1.29	0.80	0.30	1.25	
0876	fo	42	41	44	6	133
	fe	37.7	52.4	32.9	10.0	
	chi	0.49	2.48	3.74	1.60	
0177	fo	38	52	30	10	130
	fe	36.8	51.2	32.2	9.8	
	chi	0.04	0.01	0.15	0.00	
0877	fo	39	56	27	10	132
	fe	37.4	52.0	32.7	9.9	
	chi	0.07	0.31	0.99	0.00	
Total		151	210	132	40	533

$$X^2 = \Sigma \frac{(fo - fe)^2}{fe}$$

$X^2 = 13.52$ $\quad df = 9$ $\quad p > 0.05$

APPENDIX B

COURSE RATINGS 1976 THROUGH 1977

Table 19

Observed and Expected Frequencies of Course Ratings
1976 through 1977

Semester		Ratings 1-3	4	5	Total
0176	fo	14	49	63	126
	fe	14.1	42.6	69.3	
	chi	0.00	0.96	0.57	
0876	fo	16	39	64	119
	fe	13.3	40.2	65.4	
	chi	0.55	0.04	0.03	
0177	fo	9	42	69	120
	fe	13.4	40.6	66.0	
	chi	1.44	0.05	0.14	
0877	fo	16	36	74	126
	fe	14.1	42.6	69.3	
	chi	0.26	1.02	0.32	
Total		55	166	270	491

$$X^2 = \Sigma \frac{(fo - fe)^2}{fe}$$

$X^2 = 5.38$ $\quad df = 6$ $\quad p > 0.05$

APPENDIX C

INSTRUCTOR RATINGS 1976 THROUGH 1977

Table 20

Observed and Expected Frequencies of Instructor Ratings 1976 through 1977

Semester		Ratings 1-3	4	5	Total
0176	fo	6	28	92	126
	fe	7.4	23.9	94.7	
	chi	0.26	0.70	0.08	
0876	fo	11	25	83	119
	fe	7.0	22.5	89.4	
	chi	2.29	0.28	0.46	
0177	fo	7	17	96	120
	fe	7.1	22.7	90.2	
	chi	0.00	1.43	0.37	
0877	fo	5	23	98	126
	fe	7.4	23.9	94.7	
	chi	0.78	0.03	0.11	
Total		29	93	369	491

$$X^2 = \Sigma \frac{(fo - fe)^2}{fe}$$

$X^2 = 6.79$ df = 6 $p > 0.05$

APPENDIX D

PASSING GRADES FALL 1977 AND WINTER 1978

Table 21

Observed and Expected Frequencies of Passing Grades
Fall 1977 and Winter 1978

Semester		A	B	C	D	Total
0877	fo	39	56	27	10	132
	fe	37.2	52.0	31.6	11.2	
	chi	0.09	0.31	0.67	0.13	
0178	fo	34	46	35	12	127
	fe	35.8	50.0	30.4	10.8	
	chi	0.09	0.32	0.70	0.13	
Total		73	102	62	22	259

$$X^2 = \Sigma \frac{(fo - fe)^2}{fe}$$

$X^2 = 2.44$ $\quad df = 3$ $\quad p > 0.05$

APPENDIX E

COURSE RATINGS FALL 1977 AND WINTER 1978

Table 22

Observed and Expected Frequencies of Course Ratings
Fall 1977 and Winter 1978

Semester		Ratings 1-3	4	5	Total
0877	fo	16	36	74	126
	fe	10.9	38.7	76.4	
	chi	2.39	0.19	0.08	
0178	fo	4	35	66	105
	fe	9.1	32.3	63.6	
	chi	2.86	0.23	0.09	
Total		20	71	140	231

$$X^2 = \Sigma \frac{(fo - fe)2}{fe}$$

$X^2 = 5.84$ $\quad df = 2$ $\quad p > 0.05$

APPENDIX F

INSTRUCTOR RATINGS FALL 1977 AND WINTER 1978

Table 23

Observed and Expected Frequencies of Instructor Ratings
Fall 1977 and Winter 1978

Semester		Ratings 1-4	Ratings 5	Total
0877	fo	28	98	126
	fe	25.2	100.8	
	chi	0.21	0.05	
0178	fo	18	86	104
	fe	20.8	83.2	
	chi	0.25	0.06	
Total		46	184	230

$$X^2 = \Sigma \frac{(|fo - fe| - .5)^2}{fe}$$

$X^2 = 0.57$ $\quad df = 1$ $\quad p > 0.05$

APPENDIX G

COURSE RATINGS WINTER 1978 AND WINTER 1979

Table 24

Observed and Expected Frequencies of Course Ratings
Winter 1978 and Winter 1979

Semester		Ratings 1-4	Ratings 5	Total
0178	fo	39	66	105
	fe	40.4	64.6	
	chi	0.02	0.01	
0179	fo	43	65	108
	fe	41.6	66.4	
	chi	0.02	0.01	
Total		82	131	213

$$X^2 = \Sigma \frac{(|fo - fe| - .5)^2}{fe}$$

$X^2 = 0.06$ $\quad df = 1$ $\quad p > 0.05$

APPENDIX H

INSTRUCTOR RATINGS WINTER 1978 AND WINTER 1979

Table 25

Observed and Expected Frequencies of Instructor Ratings
Winter 1978 and Winter 1979

Semester		Ratings 1-4	5	Total
0178	fo	18	86	104
	fe	21.6	82.4	
	chi	0.44	0.12	
0179	fo	26	82	108
	fe	22.4	85.6	
	chi	0.43	0.11	
Total		44	168	212

$$X^2 = \Sigma \frac{(|fo - fe| - .5)^2}{fe}$$

$X^2 = 1.10$ $\quad df = 1$ $\quad p > 0.05$

APPENDIX I

PASSING GRADES WINTER 1978 AND WINTER 1979

Table 26

Observed and Expected Frequencies of Passing Grades
Winter 1978 and Winter 1979

Semester		A	B	C	D	Total
0178	fo	34	46	35	12	127
	fe	35.9	43.2	37.5	10.4	
	chi	0.10	0.18	0.17	0.25	
0179	fo	35	37	37	8	117
	fe	33.1	39.8	34.5	9.6	
	chi	0.11	0.20	0.18	0.27	
Total		69	83	72	20	244

$$X^2 = \Sigma \frac{(fo - fe)^2}{fe}$$

$X^2 = 1.46$ $\quad df = 3$ $\quad p > 0.05$

APPENDIX J

COURSE STRUCTURE

Gloria Whitney

PSY 2013 General Psychology I 3 semester hours credit

TEXT

Freedman, Jonathan L. Introductory Psychology. Addison-Wesley Publishing Company, 1978.

STUDY GUIDE

A Study Guide, containing learning objectives, instructional materials, plus a Self-Test and answers, will be distributed for each learning module of the course.

ASSIGNMENTS AND CRITERION TEST SCHEDULE

A class and Criterion Test schedule for the term will be provided. The modules that will be covered and the topics involved are shown on the Grade Record Sheet.

CRITERION TEST CONTENT

Each objective of each learning module will be tested. The Criterion Test items will be worth the grade points specified by the individual objectives. The question difficulty and style will be similar to the items presented on the Self-Tests; however, the questions used on the Criterion Tests WILL NOT be identical to those on the Self-Tests. People who study only the Self-Test questions and answers usually self-destruct on the actual (Criterion) test.

It is highly recommended that you follow the Study Technique outlined on the other side of this sheet and use the Self-Tests as actual tests of your potential performance. Used in this way, there is a high degree of relationship between Self-Test scores and the scores earned on the Criterion Tests.

COURSE GRADES

Course grades are determined entirely from Criterion Test and Activity Class grade points. The point value is listed with each objective. There are 160 grade points available across the 5 modules. Letter grade scales for the modules and the course are part of the Grade Record Sheet.

RECOMMENDED STUDY TECHNIQUES

1. Check the class schedule for the Criterion Test date and the Study Guide for the topics involved. Set up a study schedule.

2. Read the objectives for the module.

3. Read the summary at the end of the chapter/s in the text.

4. Quickly read the chapter or parts of the chapters in the text.

5. Read the first objective in the Study Guide. Study the references for that objective until you feel you can perform what is described by the objective.

6. Study the other objectives in the same way.

7. Do not attempt the Self-Test questions until you have studied all objectives in a module. Then review all objectives, wait at least 1/2 hour from your last review, and then take the Self-Test. Write your answers in the provided spaces. Take the entire test for the module before looking at the answers.

8. After completing the test, score your answers and compare the results against the grade scales. Review as needed.

REMEMBER: If you read the Self-Test questions and/or answers prior to step 7 of this procedure, or answer the Self-Test questions on an objective-by-objective basis, your Self-Test score is invalid and will likely have little relationship to the score you will earn on the Criterion Test.

MAKE-UP AND RETAKE TESTS

Activity Class grade points can be earned only on the scheduled day; these points CANNOT be made up at any other time.

Make-up Criterion Tests will be provided during the final examination period. A maximum of two tests may be made-up at that time.

If three tests are missed, your enrollment in the course will be terminated for non-participation; a W will be assigned as the final grade.

Persons who have not missed Criterion Tests during the term may elect to retake a maximum of two tests, during the final exam period, in an attempt to increase their course grade.

ATTENDANCE REQUIREMENT

Attendance on test days is required; missing more than two test sessions will result in termination of enrollment. Attendance on other days is recommended. Attendance on Activity Class days earns grade points.

APPENDIX K

COURSE AND INSTRUCTOR EVALUATION FORM

Name _____ PSY 2013
Whitney

PLEASE RATE YOUR FEELINGS CONCERNING THIS COURSE:	Poor		Average		Good
Textbook	1	2	3	4	5
Films, TV Programs and Demonstrations	1	2	3	4	5
Study Guide	1	2	3	4	5
Subject matter content of the course	1	2	3	4	5
Grading system	1	2	3	4	5
Attendance policy	1	2	3	4	5
OVER-ALL rating of the course	1	2	3	4	5
PLEASE RATE YOUR FEELINGS CONCERNING THIS INSTRUCTOR:					
Reliability in returning test scores	1	2	3	4	5
Fairness of test scoring	1	2	3	4	5
Knowledge of subject matter	1	2	3	4	5
Ability to communicate subject matter	1	2	3	4	5
OVER-ALL rating of the instructor	1	2	3	4	5

COMMENTS AND SUGGESTIONS:

APPENDIX L

GRADE POINT SCALES

MODULE AND COURSE GRADE POINT SCALES

These scales apply to both the Self-Tests and the Criterion Tests.

MODULE 1 SIGH-WHO?

Activity points	- 0	Scale:	13 - 14 = A
Test points	- 14		12 = B
Total	- 14		10 - 11 = C
			9 = D
			0 - 8 = F

MODULE 2 WHAT'S DOING OUT THERE?

Activity points	- 6	Scale:	39 - 43 = A
Test points	- 37		35 - 38 = B
Total	- 43		31 - 34 = C
			26 - 30 = D
			0 - 25 = F

MODULE 3 HIGHS AND LOWS

Activity points	- 4	Scale:	26 - 28 = A
Test points	- 24		23 - 25 = B
Total	- 28		20 - 22 = C
			17 - 19 = D
			0 - 16 = F

MODULE 4 ONE DAY AT A TIME

Activity points	- 10	Scale:	34 - 37 = A
Test points	- 27		30 - 33 = B
Total	- 37		26 - 29 = C
			23 - 25 = D
			0 - 22 = F

MODULE 5 YOU'RE OK, HOW AM I?

Activity points	- 3	Scale:	35 - 38 = A
Test points	- 35		31 - 34 = B
Total	- 38		27 - 30 = C
			23 - 26 = D
			0 - 22 = F

COURSE GRADE SCALE

Activity points	- 23	Scale:	144 - 160 = A
Test points	- 137		128 - 143 = B
Total	- 160		112 - 127 = C
			96 - 111 = D
			0 - 95 = F

APPENDIX M

ACTIVITY CLASS FORM

Name _____ PSY 2013 MOD-4

PSYCHOLOGICAL TESTING - Activity Class - 4 points

PROCEDURE:

Answer the Myers-Briggs Type Indicator questions.

After the Indicator has been scored, review the Report Form for Myers-Briggs Type Indicator which shows your preference strengths and type.

Complete this form and give it to the instructor.

EVALUATION:

How accurately do you feel that the Indicator reflects your personality?

____ All four preferences seem to be accurate.

____ Three preferences seem to be accurate.

____ Two preferences seem to be accurate.

____ One preference seems to be accurate.

____ None of the preferences seem to be accurate.

Should this Activity Class be kept as part of the course?

____ Yes ____ No

COMMENTS:

APPENDIX N

GRADE POINTS, COURSE RATINGS AND INSTRUCTOR RATINGS GROUPED BY MBTI TYPES

Table 27

BCC Sample - Raw Data
N = 200

MBTI Type	Grade	Points	Ratings	
			Course	Instructor
ISTJ*	A	152	5	5
	A	151	5	5
	A	150	5	5
	A	150	4	5
	A	147	5	5
	B	143	5	5
	B	142	5	5
	B	133	4	4
	C	127	5	4
	C	123	5	5
	C	122	4	4
ISFJ*	A	154	4	5
	A	147	4	4
	A	147	5	5
	A	144	4	5
	B	141	4	5
	B	141	5	5
	B	140	5	5
	B	130	5	5
	C	123	5	5
	C	121	4	5
	C	118	5	4
	C	116	5	5
	D	105	5	5
	D	102	5	5
	D	99	1	1
INFJ	A	151	5	5
	A	149	5	5
	A	146	4	5
	A	145	5	5
	B	132	5	5
	C	124	4	5
	D	108	5	5

Table 27 (continued)

MBTI Type	Grade	Points	Ratings	
			Course	Instructor
INTJ	A	150	5	5
	A	148	5	5
	A	147	5	5
	B	142	5	5
	C	117	4	5
ISTP	A	156	5	5
	B	132	4	4
	B	130	5	5
	C	127	4	5
	C	123	4	4
	C	118	5	5
	C	112	4	4
ISFP*	A	147	5	5
	A	147	5	5
	A	146	5	5
	A	145	4	5
	A	144	5	5
	B	139	5	5
	B	136	4	5
	B	132	5	5
	B	130	3	4
	B	129	4	5
	C	123	5	5
	C	121	5	4
	C	120	4	5
	C	119	5	5
	C	116	5	5
	C	115	5	5
	C	112	5	5
	D	101	5	5

Table 27 (continued)

MBTI Type	Grade	Points	Ratings	
			Course	Instructor
INFP*	A	155	5	5
	A	153	5	5
	A	149	5	5
	A	145	4	4
	A	144	4	4
	B	141	5	5
	B	140	5	5
	B	139	5	5
	B	139	5	5
	B	138	5	5
	B	137	5	5
	B	135	4	5
	B	130	5	5
	B	130	5	5
	B	129	5	5
	C	127	5	5
	C	127	5	5
	C	123	4	5
	C	118	4	4
	C	117	4	5
	C	117	5	5
	C	115	5	5
	C	115	4	5
	D	108	4	5
INTP*	A	150	5	5
	A	145	5	5
	A	144	5	5
	B	139	5	5
	B	137	4	5
	B	134	5	5
	B	130	5	5
	C	127	4	4
	C	122	5	4
	C	121	5	5
ESTP	B	136	5	4
	B	131	5	5
	C	121	5	5
	C	121	5	5
	C	119	5	5

Table 27 (continued)

MBTI Type	Grade	Points	Ratings	
			Course	Instructor
ESFP*	A	144	5	5
	B	134	5	5
	B	133	5	5
	B	131	5	5
	B	129	4	5
	B	129	4	5
	B	128	4	5
	B	128	4	4
	C	125	5	5
	C	125	4	4
	C	118	5	5
	C	115	4	4
	C	114	4	5
	C	114	4	5
	D	110	5	5
	D	107	4	4
	D	100	4	5
	D	97	5	4
ENFP*	A	157	5	5
	A	154	5	5
	A	151	5	5
	A	147	5	5
	A	147	4	5
	A	146	5	5
	A	145	5	5
	A	145	5	5
	A	145	4	4
	A	144	5	5
	B	141	5	5
	B	140	4	5
	B	140	4	4
	B	137	5	5
	B	134	5	5
	B	132	4	4
	B	132	4	4
	B	131	4	5
	B	130	4	5
	B	129	4	5
	B	128	3	5
	B	128	5	5
	B	128	4	4
	B	128	4	4

Table 27 (continued)

MBTI Type	Grade	Points	Ratings	
			Course	Instructor
ENFP* (continued)	C	126	5	5
	C	126	4	5
	C	125	4	5
	C	125	4	5
	C	124	5	5
	C	123	5	5
	C	123	4	4
	C	121	4	5
	C	113	5	5
	D	108	5	5
	D	107	4	5
	D	106	4	4
ENTP	C	113	5	5
ESTJ	A	153	4	4
	A	150	4	5
	A	149	5	5
	B	139	5	5
	B	129	5	5
	C	126	3	4
	C	118	5	5
	C	115	5	5
ESFJ*	A	151	5	5
	A	151	5	5
	A	147	4	5
	A	147	5	5
	A	144	5	5
	B	138	5	5
	B	138	5	5
	B	136	5	5
	B	132	5	4
	B	131	4	5
	B	130	5	5
	C	126	5	5
	C	126	4	5
	C	120	5	5
	C	115	4	5
	C	113	4	5
	D	106	4	5

Table 27 (continued)

MBTI Type	Grade	Points	Ratings	
			Course	Instructor
ENFJ*	A	157	5	5
	A	156	5	5
	A	151	5	5
	A	146	5	5
	A	145	5	5
	A	144	5	5
	B	137	5	5
	B	135	5	5
	B	133	4	5
	B	130	4	4
	C	127	5	5
	C	127	3	5
	C	125	5	5
	D	110	5	5
	D	109	5	5
ENTJ	A	145	2	2
	C	123	4	4
	C	119	5	5

* Types included in the discriminant analysis.

APPENDIX O

GRADE POINTS OF STUDENTS INCLUDED IN THE DISCRIMINANT ANALYSIS COMPARED WITH STUDENTS NOT INCLUDED

Table 28

Grade Points of the MBTI Types Included in the Discriminant Analysis

Score(X)	Frequency(f)	fX	fX^2
157	2	314	49,298
156	1	156	24,336
155	1	155	24,025
154	2	308	47,432
153	1	153	23,409
152	1	152	23,104
151	5	755	114,005
150	3	450	67,500
149	1	149	22,201
147	9	1,323	194,481
146	3	438	63,948
145	7	1,015	147,175
144	8	1,152	165,888
143	1	143	20,449
142	1	142	20,164
141	4	564	79,524
140	4	560	78,400
139	4	556	77,284
138	3	414	57,132
137	4	548	75,076
136	2	272	36,992
135	2	270	36,450
134	3	402	53,868
133	3	399	53,067
132	4	528	69,696
131	3	393	51,483
130	8	1,040	135,200
129	5	645	83,205
128	6	768	98,304
127	6	762	96,774
126	4	504	63,504
125	5	625	78,125
124	1	124	15,376
123	6	738	90,774
122	2	244	29,768
121	4	484	58,564
120	2	240	28,800
119	1	119	14,161
118	3	354	41,772
117	2	234	27,378
116	2	232	26,912
115	5	575	66,125

Table 28 (continued)

Score (X)	Frequency (f)	fX	fX^2
114	2	228	25,992
113	2	226	25,538
112	1	112	12,544
110	2	220	24,200
109	1	109	11,881
108	2	216	23,328
107	2	214	22,898
106	2	212	22,472
105	1	105	11,025
102	1	102	10,404
101	1	101	10,201
100	1	100	10,000
99	1	99	9,801
97	1	97	9,409
Total	164	21,540	2,860,822

Table 29

Grade Points of the MBTI Types Not Included in the Discriminant Analysis

Score (X)	Frequency (f)	fX	fX^2
156	1	156	24,336
153	1	153	23,409
151	1	151	22,801
150	2	300	45,000
149	2	298	44,402
148	1	148	21,904
147	1	147	21,609
146	1	146	21,316
145	2	290	42,050
142	1	142	20,164
139	1	139	19,321
136	1	136	18,496
132	2	264	34,848
131	1	131	17,161
130	1	130	16,900
129	1	129	16,641
127	1	127	16,129
126	1	126	15,876
124	1	124	15,376
123	2	246	30,258
121	2	242	29,282
119	2	238	28,322
118	2	236	27,848
117	1	117	13,689
115	1	115	13,225
113	1	113	12,769
112	1	112	12,544
108	1	108	11,664
Total	36	4,764	637,340

Means and Standard Deviations

The raw score formulas for ungrouped frequency distributions appear on page 51 of Snodgrass (1977).

MBTI Types Included in the Analysis

$$\bar{X} = \frac{\Sigma fX}{N} \qquad s^2 = \frac{\Sigma fX^2}{N} - \bar{X}^2$$

$$\bar{X} = \frac{21,540}{164} \qquad s^2 = \frac{2,860,822}{164} - (131.34)^2$$

$$\bar{X} = 131.34 \qquad s^2 = 193.84$$

$$s = 13.92$$

MBTI Types Not Included in the Analysis

$$\bar{X} = \frac{\Sigma fX}{N} \qquad s^2 = \frac{\Sigma fX^2}{N} - \bar{X}^2$$

$$\bar{X} = \frac{4,764}{36} \qquad s^2 = \frac{637,340}{36} - (132.33)^2$$

$$\bar{X} = 132.33 \qquad s^2 = 192.66$$

$$s = 13.88$$

t Test

The formula for testing the difference between two independent sample means, when $N_1 \neq N_2$, appears on page 241 of Snodgrass (1977).

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{N_1 s_1^2 + N_2 s_2^2}{N_1 + N_2 - 2}\left(\frac{1}{N_1} + \frac{1}{N_2}\right)}}$$

$$t = \frac{132.33 - 131.34}{\sqrt{\frac{36(192.66) + 164(193.84)}{36 + 164 - 2}\left(\frac{1}{36} + \frac{1}{164}\right)}}$$

$t = 0.35$ $\quad$ $df = 198$ $\quad$ $p > 0.05$

APPENDIX P

COURSE RATINGS BY STUDENTS INCLUDED IN THE DISCRIMINANT ANALYSIS COMPARED WITH STUDENTS NOT INCLUDED

Table 30

Course Ratings by MBTI Types Included in the Discriminant Analysis

Score(X)	Frequency(f)	fX	fX^2
5	102	510	2,550
4	57	228	912
3	4	12	36
2	0	0	0
1	1	1	1
Total	164	751	3,499

Table 31

Course Ratings by MBTI Types Not Included in the Discriminant Analysis

Score(X)	Frequency(f)	fX	fX^2
5	24	120	600
4	10	40	160
3	1	3	9
2	1	2	4
1	0	0	0
Total	36	165	773

Means and Standard Deviations

The raw score formulas for ungrouped frequency distributions appear on page 51 of Snodgrass (1977).

MBTI Types Included in the Analysis

$$\bar{X} = \frac{\Sigma fX}{N} \qquad s^2 = \frac{\Sigma fX^2}{N} - \bar{X}^2$$

$$\bar{X} = \frac{751}{164} \qquad s^2 = \frac{3,499}{164} - (4.58)^2$$

$$\bar{X} = 4.58 \qquad s^2 = 0.36$$

$$s = 0.60$$

MBTI Types Not Included in the Analysis

$$\bar{X} = \frac{\Sigma fX}{N} \qquad s^2 = \frac{\Sigma fX^2}{N} - \bar{X}^2$$

$$\bar{X} = \frac{165}{36} \qquad s^2 = \frac{773}{36} - (4.58)^2$$

$$\bar{X} = 4.58 \qquad s^2 = 0.49$$

$$s = 0.70$$

t Test

The formula for testing the difference between two independent sample means, when $N_1 \neq N_2$, appears on page 241 of Snodgrass (1977).

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{N_1 s_1^2 + N_2 s_2^2}{N_1 + N_2 - 2}\left(\frac{1}{N_1} + \frac{1}{N_2}\right)}}$$

$$t = \frac{4.58 - 4.58}{\sqrt{\frac{164(0.36) + 36(0.49)}{164 + 36 - 2}\left(\frac{1}{164} + \frac{1}{36}\right)}}$$

$t = 0.00$ $\quad$ $df = 198$ $\quad$ $p > 0.05$

APPENDIX Q

INSTRUCTOR RATINGS BY STUDENTS INCLUDED IN THE DISCRIMINANT ANALYSIS COMPARED WITH STUDENTS NOT INCLUDED

Table 32

Instructor Ratings by MBTI Types Included in the Discriminant Analysis

Score(X)	Frequency(f)	fX	fX^2
5	136	680	3,400
4	27	108	432
3	0	0	0
2	0	0	0
1	1	1	1
Total	164	789	3,833

Table 33

Instructor Ratings by MBTI Types Not Included in the Discriminant Analysis

Score(X)	Frequency(f)	fX	fX^2
5	28	140	700
4	7	28	112
3	0	0	0
2	1	2	4
1	0	0	0
Total	36	170	816

Means and Standard Deviations

The raw score formulas for ungrouped frequency distributions appear on page 51 of Snodgrass (1977).

MBTI Types Included in the Analysis

$$\bar{X} = \frac{\Sigma fX}{N} \qquad s^2 = \frac{\Sigma fX^2}{N} - \bar{X}^2$$

$$\bar{X} = \frac{789}{164} \qquad s^2 = \frac{3,833}{164} - (4.81)^2$$

$$\bar{X} = 4.81 \qquad s^2 = 0.23$$

$$s = 0.48$$

MBTI Types Not Included in the Analysis

$$\bar{X} = \frac{\Sigma fX}{N} \qquad s^2 = \frac{\Sigma fX^2}{N} - \bar{X}^2$$

$$\bar{X} = \frac{170}{36} \qquad s^2 = \frac{816}{36} - (4.72)^2$$

$$\bar{X} = 4.72 \qquad s^2 = 0.39$$

$$s = 0.62$$

t Test

The formula for testing the difference between two independent sample means, when $N_1 \neq N_2$, appears on page 241 of Snodgrass (1977).

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{N_1 s_1^2 + N_2 s_2^2}{N_1 + N_2 - 2}\left(\frac{1}{N_1} + \frac{1}{N_2}\right)}}$$

$$t = \frac{4.81 - 4.72}{\sqrt{\frac{164(0.23) + 36(0.39)}{164 + 36 - 2}\left(\frac{1}{164} + \frac{1}{36}\right)}}$$

$t = 0.90$ $\quad$ $df = 198$ $\quad$ $p > 0.05$

APPENDIX R

COURSE WITHDRAWALS BY MBTI TYPE

Table 34

Frequencies of MBTI Types of Students
Who Withdrew from PSY 2013
N = 46

ISTJ	ISFJ	INFJ	INTJ
N= 3	N= 3	N= 3	N= 0
%= 7	%= 7	%= 7	%= 0
ISTP	ISFP	INFP	INTP
N= 2	N=11	N= 0	N= 0
%= 4	%=24	%= 0	%= 0
ESTP	ESFP	ENFP	ENTP
N= 1	N= 6	N= 5	N= 2
%= 2	%=13	%=11	%= 4
ESTJ	ESFJ	ENFJ	ENTJ
N= 1	N= 4	N= 3	N= 2
%= 2	%= 9	%= 7	%= 4

Note. Percentage total equals 101% due to rounding.

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